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FEVER:

ITS CAUSE, MECHANISM AND RATIONAL TREATMENT.

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IN the classical monograph on inanition, by Chossat, published in 1843, is the following sentence: Inanition is "a cause of death which marches in front and in silence in every disease in which alimentation is not in a normal condition."[1]

A few years later, Graves, of Dublin, insisting upon the importance of alimentation in the management of continued fever, said that if he had met with more success than others in the treatment of the disease, it was owing, in a great degree, to the counsel of a country physician of great shrewdness, who advised him never to let his patients die of starvation.

Nearly half a century has elapsed since Chossat, comparing the results of a series of elaborate experiments on the lower animals with pathological phenomena in the human subject, recognized inanition as a cause of death in diseases which were then treated by depletory and so-called antiphlogistic measures, and since the "shrewd country physician" advised Dr. Graves never to let his patients die of starvation. Within this half-century, the ideas embodied in the two quotations I have made have taken a permanent place among the accepted principles of the science of medicine. The researches of the physiologist enabled him to recognize the spectre of inanition, marching "in front and in silence" with disease, and the great clinical observer "fed fevers;" the natural history of many diseases, undisturbed by active therapeutical measures, has been studied, and the self-limited character of a large number of these diseases has been established; and now, in the treatment of certain cases, abortive measures having been found ineffectual, the resisting and recuperative powers of patients are sustained.

An important result of the studies of physiologists with reference to animal heat, and of pathologists with reference especially to the essential fevers, is that, important organs being protected against serious complications and accidents, and the nutrition of the body being measurably supported, a fever may run its course, leaving the patient in a physical condition in which speedy and complete convalescence is almost certain. The life of an acute disease usually is short; and a self-limited disease, such as typhoid fever, is a morbid force which calls for resistance on the part of the system for but a certain time. In cases of acute disease, as a rule, there is an inherent tendency to recovery. A disease which involves in its course a rapid and abnormal consumption of matter within the body can rationally be met by the introduction and assimilation, if possible, of nutritive material to save or repair the destruction of tissue. That there is abnormal destruction of tissue in fevers is rendered certain by the progressive loss in body-weight and the marked increase in the elimination of carbonic acid and nitrogenized excrementitious matters; and it is the province of the physician to keep this loss within the lowest limits, and to repair it as speedily and as effectually as possible.

The principal object of this address will be to show how the metamorphosis of matter involved in the normal production of animal heat is accomplished, how the abnormal production of heat in fever, involving, as it does, abnormal activity in the metamorphosis of tissue, may be restricted, and how abnormal destruction of tissue may be limited and repaired.

It is well known to physiologists that the production of animal heat is one of the phenomena attendant upon the general processes of nutrition. It is also well known that the process with which the production of heat is most intimately connected is oxidation of certain matters which are either contained in food or form a part of the tissues of the body. This fact, a knowledge of which dates from the researches of Lavoisier, in the latter part of the last century, has now become firmly established; and the relations between the consumption of oxygen—with the production of certain excrementitious matters—and the generation of heat within the body have, in late years, been the subject of much physiological experimentation. Attempts have been made by Senator and others, to measure directly the quantity of heat produced in the body; with the result of showing that, in mammals, there are produced about four heat-units per hour, per pound weight of the body.[1] According to this estimate, a man weighing one hundred and forty pounds would produce 13,440 heat-units in twenty-four hours.

While the direct method of estimating the heat produced by the body has some elements of uncertainty, it has the advantage, at least, of being similar to the method by which the heat-value of food has been ascertained. On the other hand, the indirect method, employed by some observers, which is said by Dr. Foster to be "as trustworthy as any," seems to me to involve such

[1] Chossat: Recherches expérimentales sur l'inanition. Paris, 1843, p. 194.

[1] The English heat-unit represents the heat required to raise the temperature of one pound of water one degree Fahrenheit. The Continental heat unit represents the heat required to raise the temperature of one litre of water one degree Centigrade. One heat-unit, Continental, equals about four (3.9628) heat-units, English. Four heat-units per pound per hour (English) would equal about one heat-unit (Continental) per pound per hour, or 2.2 heat-units (Continental) per kilogramme per hour. In what is to follow, I shall adopt the English standard for the heat-unit.

possibly enormous errors as to be of little value. This method consists in "simply subtracting the normal daily mechanical expenditure from the normal daily income. Thus, 150,000 kilogramme-metres subtracted from 1,000,000 kilogramme-metres, gives 850,000 kilogramme-metres as the daily expenditure in the form of heat."[1] In this method the only reasonably accurate element in the calculation is the "normal daily income," which is ascertained by estimating the heat-value of food in a normal diet. The calculation of the "normal daily mechanical expenditure," is inaccurate almost to the degree of absurdity. The force expended in the circulation and respiration is estimated, the force in locomotion and in other muscular work is guessed at, and all of these estimates of expenditure of energy are calculated in foot-pounds, or kilogramme-metres, which are afterward reduced to heat-units. Taking the estimate of the work of the heart alone, if Dr. Haughton's calculation of the quantity of blood discharged by each ventricular systole, which is three ounces, be accepted, a certain result is arrived at; while, if we accept—and on equally good authority—the view that the quantity discharged is between five and six ounces, the figures are nearly doubled, and the error is multiplied by about 100,000 beats of the heart in twenty-four hours.[2] The estimates, also, of the force used in respiratory movements, locomotion, etc., are not more reliable; and while it is admitted that one pound weight falling 772 feet will turn a wheel, the friction of which will raise the temperature of one pound of water one degree Fahrenheit, no one has been able to raise one pound weight to the height of 772 feet, or 772 pounds to the height of one foot, by using the heat which will raise the temperature of one pound of water one degree. In the calculations applied to physiological processes, it is always the heat produced which is converted into force; and in fixing the formula for such calculations, it is always the force which is converted into heat. It seems to me, therefore, that the most inaccurate of the direct methods of estimating the heat produced in the body is more useful than any calculations which involve such enormous sources of error as must exist in the estimates of daily mechanical expenditure. However, in the reflections that are to follow, I shall have nothing to do with the conversion of heat into force, but shall confine myself to the questions involved in the normal and abnormal production of heat in the human body.

The late Dr. John C. Draper, following the experiments by Senator and others upon the inferior animals, made a series of observations on his own person, in which he showed that his body, which he found was equal in bulk to three cubic feet, was capable of raising the temperature of three cubic feet of water five degrees Fahr. in an hour. During the observation, the temperature under the tongue was reduced one degree.[3] Making the correction—which was not made by Dr. Draper—of one degree lost by the body and imparted to the water,[1] I estimated that the body produces four heat-units per pound weight per hour, which is nearly the result obtained by Senator, and that, consequently, a man weighing 140 pounds would produce 13,440 heat-units in twenty-four hours, in a condition of absolute repose. This quantity would, of course, be increased by muscular exercise.

In a series of experiments made upon my own person, for twenty-four hours, under a liberal diet, I calculated the heat-value of the food ingested as equal to 14,979.15 heat-units. At that time (1878), I weighed 186½ pounds, and, according to my estimate, I produced 17,880 heat-units in twenty-four hours. There was no difference in the body-weight at the beginning and at the end of the observation.[2] This observation showed that nearly one-sixth of the heat estimated as actually produced by the body was not accounted for by the heat-value of the food taken. There can be little question with regard to the accuracy of the accepted methods for estimating the heat-value of articles of food; and it follows logically that there must either be a grave error in the estimate of the heat produced by the body, or that there are certain processes going on within the body not taken into account by physiologists, which involve a considerable production of animal heat. It is to be remembered, also, that I made no allowance for the conversion of a certain proportion of the heat produced in the body into force expended in circulation, respiration, locomotion, etc.

Indirect observations have shown that, out of the daily quantity of hydrogen introduced in organic combinations in the food, a large proportion (about eighty-five per cent.) cannot be accounted for by the organic ingredients of the excretions; and it has also been shown that there is generally an excess of water discharged from the body, over that introduced with the food and drink.[3] In another experiment made on my own person, in 1878, I fasted for thirty-three hours, beginning my observations on the discharge of water, nine hours after the beginning of the fast, in order to allow the digestion of the last meal to be completed. In twenty-four hours, the discharge exceeded the introduction of water by forty-six ounces. I calculated the quantity of water discharged, by deducting from the total loss of body-weight the loss of solid matters in the urine and the estimated loss of carbon by the lungs. The quantity remaining represented the loss of water in excess of the water introduced. The quantity of water introduced was twenty ounces. No feces were passed during this observation.

In another observation, the total discharge of water for a period of five days was estimated by the following method:

The weight of the ingesta for the five days was added to the body-weight at the beginning of the observation.

[1] Foster: Text-book of Physiology, London, 1883, p. 459. A kilogramme-metre, or a kilogramme lifted a metre, is equal to 7.232 foot-pounds, or pounds lifted a foot. (Pavy, Food and Dietetics, Philadelphia, 1874.)

[2] Flint: The Source of Muscular Power, N. Y., 1878, p. 70.

[3] Draper: The Heat Produced by the Body, and the Effects of Exposure to Cold. American Journal of Science and Arts, New Haven, December, 1872. Dr. Draper's experiments were made under conditions which possibly involved serious inaccuracies; and they are useful and interesting chiefly from the correspondence of the results with those obtained by Senator and others, in which corrections were carefully made.

[1] Flint: Experiments and Reflections upon Animal Heat. American Journal of the Medical Sciences, Philadelphia, April, 1879, p. 343.

[2] Flint: Experiments and Reflections upon Animal Heat, loc. cit., p. 355.

[3] Dalton: Human Physiology, Philadelphia, 1882, p. 37.

From this were deducted, the weight of the urine and feces for the five days, the estimated weight of carbon eliminated, and the body-weight at the end of the observation. The result represented the total discharge of water by the lungs and skin, which, added to the water of the urine and feces, gave the total discharge of water. From this was subtracted the water introduced in food and drink. The total excess of water discharged for the five days was 62.78 ounces.[1] The subject of this experiment weighed 119.2 pounds at the beginning of the observation. At the end of the five days, having walked 317½ miles, he weighed 115.75 pounds.

The observations thus briefly described seem to show that, under certain circumstances at least, water is actually formed in the body by the union of oxygen with hydrogen. In the observation made fasting for twenty-four hours, the quantity thus formed was very large. If it can be assumed that water is formed in this way, the heat-value of hydrogen being very great, there is little difficulty in accounting for the heat which has been estimated by direct observation to be produced in the body, as well as for a considerable surplus of heat expended in the form of muscular force. The theory, however, that the oxidation of hydrogen in the body is an important factor in the production of animal heat leads to very interesting and somewhat novel reflections with regard to the physiological relations of water to the general processes of nutrition.

Water regarded as a product of excretion. There are two substances that result from the physiological wear of the tissues, which may be taken as typical products of excretion. One of these, carbonic acid, is a non-nitrogenized principle; and the other, urea, is nitrogenized. Both of these principles are produced in the tissues and are carried by the blood to eliminating organs. The excretion of both is influenced by the activity of molecular changes in the body. It is with these principles that I shall compare the water which is, in all probability, formed in the body and discharged, under certain circumstances at least, in excess of the water of food and drink.

An excrementitious substance is a principle discharged from the body and produced by physiological wear, chiefly in the form of oxidation, of the organism. It is probable that the organism, under normal conditions as regards alimentation, use of parts, etc., produces a quantity of excrementitious matter which is fixed between certain physiological limits. When alimentation is excessive, a certain proportion of nutritive matter is represented in an increased discharge of excretions. This is marked as regards both carbonic acid and urea, particularly in the increased discharge of urea under an alimentation containing an excess of nitrogenized alimentary matters. Starch, sugar, fats, and albuminoids are not discharged from the body in health, but are eliminated in the form of carbonic acid, urea, urates, etc., and water. Muscular work increases immensely the discharge of carbonic acid, in a less degree the discharge of urea, and it notably increases the discharge of water.[2] Muscular work also increases the production of animal heat, but the temperature of the body is regulated within normal limits by evaporation from the general surface. When an excess of food is taken habitually and for a long time, there generally results an abnormal accumulation of fat, it being impossible for the elimination of carbonic acid to keep pace with the introduction and assimilation of food, unless there be a large expenditure of heat and force in muscular work. The excess of nitrogenized food is disposed of largely in the form of urea; but it is probable that a certain part of this excess is converted into fat, and the muscular substance cannot be increased in bulk except by exercise, and then only within certain restricted limits.

As compared with carbonic acid and urea, the water produced in the body seems, to a great extent, to be subject to the same laws. It is a product of oxidation within the organism; its production may be influenced by alimentation, independently of the quantity of water introduced, and by muscular work; it is discharged through organs recognized as organs of elimination, such as the lungs, skin, and kidneys; but its chief point of similarity with the matters generally recognized as excrementitious is in its mode of production.

It has been thought that excrementitious principles, if their elimination be interrupted, are of necessity poisonous when retained in the system. This certainly is not true of water; but the opinion upon this point, with regard to principles commonly regarded as excrementitious, is now open to serious question. It is probable that carbonic acid is not in itself poisonous, and that its retention in the blood produces death by interfering with the absorption of oxygen. There are few conditions under which an animal can be placed, in which carbonic acid can be made to accumulate in great quantity in the blood without interfering with the supply of oxygen; but in the well-known experiments of Regnault and Reiset, dogs and rabbits were exposed for many hours to an atmosphere containing twenty-three per cent. of carbonic acid artificially introduced, with between thirty and forty per cent. of oxygen, without any ill effects.[1] It is now thought by some pathologists that the so-called uræmic convulsions are not due purely and simply to the poisonous effects of the retention of urea in the blood, although this is still an open question.

If it be assumed that water is produced *de novo* in the economy, in its method of production, it closely resembles carbonic acid; but it differs from carbonic acid in having certain uses so important as to lead to its frequent introduction with the food and drink. Its chief use, however, as regards nutrition, is as a solvent; but in this it is aided by carbonic acid, the presence of which, especially in the urine, increases the solvent properties of the liquids of the organism. It is evident, also, that water, as a constituent part of the tissues, tends to preserve their proper consistence.

The water of food and drink has important indirect uses connected with nutrition, both as a solvent of nutritive and excrementitious matters and as a constituent part of the tissues; but the water produced

[1] Flint: Human Physiology, N. Y., 1884, pp. 516, 517.

[2] Pettenkofer and Voit: Journal of Anatomy and Physiology, Cambridge and London, 1868, vol. ii. p. 181. "The elimination of water is very much increased by work, and the increase continues during the ensuing hours of sleep." This was one of the conclusions arrived at from experiments upon a man, twenty-eight years of age, kept for twenty-four hours in a large "respiration apparatus."

[1] Annales de chimie et de physique, Paris, 1849, 3me série, tome xxvi.

within the body by the union of oxygen with hydrogen behaves, in the manner of its production and elimination, like an excrementitious matter.

If this view be accepted, it is evident that the two excrementitious principles, with the production of which the generation of animal heat is most closely connected, are water and carbonic acid. Under ordinary conditions of alimentation, the production of carbonic acid probably has the greater relative importance; but in starvation, while the excretion of carbonic acid is diminished, the production of water, as shown in my starvation-experiment, is probably very largely increased. It is evident that the production o carbonic acid is a much more important factor in the generation of animal heat than is the formation of urea. In the experiment referred to, I calculated the heat-value of the urinary nitrogen as equal to 1677.70 heat-units, and the heat-value of the carbon eliminated as equal to 10,759.09 heat-units. The deficiency, as regards the heat actually produced, must have been represented by the excess of water discharged, which amounted to forty-six ounces, the hydrogen of which has a heat-value equal to 19,751.75 heat-units.[1] Persons exposed to intense cold, as in the Arctic regions, are known to require enormous quantities of food rich in fatty matters;[2] and the production of carbonic acid is probably very greatly increased, although direct observations on this point are wanting.

The foregoing remarks on the physiology of animal heat have been simply preliminary to a discussion of fever; and the influence of the nervous system upon calorification, which is so important in disease, will be considered only in its pathological relations.

The mechanism of fever. The phenomena and mechanism of fever in all its varieties constitute much too large a subject for full discussion within the proper limits of this address. It has been rendered probable by recent bacteriological studies that all of the essential fevers are due primarily to the presence of microörganisms, those producing typhoid fever, especially, having been isolated, cultivated, and accurately described. Fevers symptomatic of local inflammations will form no part of the question now under consideration; and I do not propose to take up the question of pyrexia due to exposure to external heat, as in insolation. The condition which I shall consider, as the type of fever, is the pyrexia in typhoid fever, produced by a definite microörganism and having a duration restricted within certain limits which do not present very wide variations. Typhoid fever is strictly an essential fever, producing, like other fevers, certain parenchymatous degenerations and certain secondary effects upon the nervous system; but it is only the nature, mechanism, and rational treatment of the fever itself which I propose to discuss.

The cause of the pyrexia in typhoid fever is twofold. The more important factor is an exaggeration of the chemical changes taking place in the organism, which generate the animal heat within normal limits. A less important factor is a disturbance of the processes of equalization of the heat of the body mainly by the action of the skin. That an exaggeration of heat-producing processes within the body is an important element in the production of fever, is rendered certain by the excessive consumption of oxygen and discharge of carbonic acid and urea. In health, the discharge of carbonic acid and urea is compensated by the introduction of food, which also has a certain influence upon the quantities of these substances eliminated. In health, there are important influences, also, which depend upon muscular work and activity. In an essential fever, the heat-producing processes seem to be for the time removed from normal regulating influences. Even when no food is taken, the fever continues and the excessive discharge of carbonic acid and urea progresses. The regulating action of the skin is enfeebled or absent. In a fever in which no attempt is made to support the system by alimentation, the phenomena of inanition are added to those of the pyrexia. Simple inanition in a healthy subject is marked by a diminution in the excretion of carbonic acid and urea, with a lowering of the animal temperature, and there is usually but little muscular work. In an essential fever, it seems as if the body were at work, producing an excessive discharge of excretions, without adequate compensation by sufficient alimentation and without a proper regulation of the heat of the body by cutaneous transpiration. Assuming the failure of measures employed to abort the disease, the excessive waste of tissue pursues its course until the morbid processes are arrested by self-limitation, or until the patient dies, either from secondary effects, referable to the persistence of very high temperature, or from simple asthenia. In cases of death from uncomplicated typhoid fever, there usually is very great emaciation.

The waste of the organism usually is most marked as regards the adipose tissue, the destruction of which is probably represented in greatest part by the excessive discharge of carbonic acid. The muscles, also, undergo degeneration, which is at first of the variety called parenchymatous. The destruction of the muscular tissue is probably represented in greatest part by the excessive discharge of urea.

If we can logically view water formed in the body in the light of an excrementitious product, the formation of which in health is closely connected with the process of calorification, the changes noted in most of the cases of typhoid fever, as regards the production and discharge of water, become very important. In nearly all essential fevers there is thirst, but the discharge of water by the skin and kidneys is notably diminished, especially the discharge by the skin, which is dry and hot. In health, the formation of water, with its inevitable generation of heat, seems to carry with it the conditions for equalization of the animal temperature by cutaneous transpiration. In simple inanition, the tissues of the body are economized by the excessive formation of water and the increased prominence of this process in calorification. In health, when there is excessive muscular exertion, there is an increased discharge of water, as was noted by Pettenkofer and Voit. In fever, however, the fats and solid tissues undergo destruction

[1] The temperature under the tongue at the beginning of the twenty-four hours of the observation was 99° Fahr. At the end of the twenty-four hours it was 97¾°.

[2] The late Dr. Hayes stated that on one occasion he saw an Esquimau consume ten pounds of walrus flesh and blubber at a single meal. (American Journal of the Medical Sciences, Philadelphia, July, 1859.)

and certain degenerations. The formation of water seems to be diminished, and certainly there is a diminished discharge of water from the body attending the increase in the discharge of carbonic acid and urea. Whatever be the essential cause of the pyrexia, the consumption of matter in the production of the excessive heat is chiefly of fat and muscular tissue; presenting a striking contrast to the process of calorification in simple inanition and in violent muscular exertion, which latter condition would actually raise the temperature of the body, were it not for the increased formation of water and the cutaneous transpiration. It would seem that in health, when there occurs any unusual demand for heat to be used in muscular work, the production of water, as well as of carbonic acid, is increased; while, in fever, the pyrexia is fed, so to speak, by the fatty and solid tissues of the body alone. In health, muscular work confined within normal limits induces nutritive activity and improved assimilation of food. In fevers, the activity is mainly degenerative and the assimilative processes are seriously impaired.

These considerations lead naturally to some modification of accepted views with regard to the theories of fever, and render our ideas on these questions more positive and definite than heretofore. I shall express these ideas in the form of propositions, some of which are, to a certain extent, novel:

1. It is probable that the original cause of most, if not of all the essential fevers is a microörganism, different in character in different forms of fever.

This proposition is based upon bacteriological researches of recent date, especially with regard to typhoid fever.

2. Defining fever as an abnormal elevation in the general temperature of the body, the pyrexia is due to the following modifications in the normal heat-producing processes:

A. Oxidation of certain constituents of the tissues, probably by reason of the presence of microörganisms in the blood, is exaggerated independently of increased muscular work and without being compensated by a corresponding increase in the appropriation of nutritive material. This increased waste of tissue is represented by the excess of carbonic acid and urea excreted.

B. The part which the formation of water within the body plays in the production of heat is either suppressed or is greatly diminished in prominence, together with the equalizing action of cutaneous transpiration.

This proposition is based upon clinical facts, which show an increased excretion of carbonic acid and urea and a diminished excretion of water in fevers, and upon experiments which show that muscular work, while it increases heat-production, increases the production of water.

3. Fever produces abnormal consumption of fat, with parenchymatous degenerations, for the following reasons:

A. The fat is consumed because it feeds the pyrexia more readily than do the other tissues of the body, and its consumption is the most important source of carbonic acid.

B. Parenchymatous degenerations of muscular tissue and of the solid organs occur, chiefly because the abnormal transformations of these parts, which result in an excess of urea and which probably, also, contribute to the excess of carbonic acid, are not compensated by the appropriation of nutritive matters from the blood.

C. It is well known that patients with unusual adipose or muscular development are likely to present a more intense pyrexia in fevers than are those whose adipose and muscular development is smaller.

Finally. *An essential fever is an excessive production of heat in the body, induced by a special morbific agent or agents, and due to excessive oxidation, with destruction of the tissues of the body, and either a suppression or a considerable diminution in the production of water.*

Suppression or great diminution of cutaneous transpiration in the essential fevers, while it contributes, in a measure, to the rise in temperature, is not itself a cause of fever.

I do not propose to discuss at length the influence of the nervous system on the normal production of heat or upon fevers. It is well known that the nervous system is capable of modifying the local circulations and of producing local changes in temperature. Some physiologists have endeavored to locate a heat-centre, as well as a vasomotor centre, and some varieties of fever are regarded as due to morbid action of nerve-centres, either direct or reflex. A consideration of these questions, except in so far as the nervous system is secondarily affected in fevers, would extend this address beyond its proper limits. I shall, however, allude to certain conditions of the nervous system in fevers in connection with what I shall have to say on the subject of treatment.

Rational treatment of fever. Symptoms referable to the nervous system are nearly always more or less prominent in essential fevers of a grave character. In the great majority of cases, at least, the disturbances of the nervous system are secondary and are due to the pyrexia, being intense generally in proportion to the intensity of the fever itself. While the special morbific cause of typhoid fever is, of course, the cause of the delirium, coma vigil, hebetude, etc., observed in rave cases, it is rational to suppose that it acts as a secondary cause of these phenomena, by virtue of changes induced directly by the prolonged elevation of body-temperature; and the same may be said of the pulse, which is high usually in proportion to the intensity of the pyrexia. Certain it is, that a mere reduction of the temperature, by means which can not be presumed to affect the special cause of the disease, is nearly always attended with an amelioration of the nervous symptoms and a reduction in the rate of the pulse.

The parenchymatous degenerations and the alterations in the structure of the muscles and of the secreting cells of glands are unquestionably due to modifications in nutrition produced by the action of microorganisms; and it is well known that in typhoid fever and in pneumonic fever these microörganisms are deposited in special parts, as the intestinal glands and the lungs. It is certainly a rational object of treatment to confine these degenerations within the narrowest possible limits.

While it is not possible exactly to limit different measures of treatment to particular phenomena, there are certain therapeutical indications specially called for by morbid processes which relate to different systems

and organs of the body. These measures may be classified as follows:

1. Reduction of the general temperature by the external application of cold.

2. Reduction of temperature by the internal administration of antipyretics.

3. Promotion of general nutrition by alimentation.

4. Measures to supply to the system matters that can be consumed in the excessive production of heat, thereby retarding destruction of tissue.

The application of cold to the surface by means of cold baths, sponging, etc., is now almost universal in the treatment of the essential fevers. While the value of this therapeutical measure is undoubted, and while its employment of late years has unquestionably diminished the fatality and abridged the duration of typhoid fever, writers are not agreed upon an exact explanation of its mode of action.

If the proposition that fever is due to the excessive production of heat be accepted as true, the explanation of the beneficial effects of refrigeration of the surface in fevers seems to me to be very simple and entirely satisfactory.

In health, when the body is subjected to excessive cold, the normal temperature is maintained, not only by retarding the radiation of heat from the surface by appropriate clothing, but by an actual increase in the production of heat. External cold increases the consumption of oxygen and the production of carbonic acid. The increased production of heat is promoted by muscular exercise, and the material necessarily consumed is supplied by what, under ordinary conditions, would be an excessive assimilation of food, particularly of fatty matters, which have a high heat-value. The enormous consumption of fats in excessively cold climates is an evidence of this fact.

In fevers, there is an excessive production of heat, which raises the temperature of the body, partly for the reason that the equalizing action of cutaneous transpiration is impaired. If we remove part of this excessive heat by the application of cold to the surface, the temperature of the body is necessarily reduced, and it only remains for clinical observation to determine whether or not this reduction of temperature be beneficial. Its beneficial effects, however, are unquestionable.

Physiological and pathological conditions are thus brought into striking contrast; and the pathological phenomena are readily explained in accordance with physiological principles.

In the healthy body exposed to excessive cold, we have given the condition of cold. This is met by a physiological increase in the processes of calorification, and by protection of the surface against loss of heat.

In the organism affected with fever, we have given, as a fixed condition, an increase in the processes of calorification. This is to be met by artificial external conditions in which the excess of heat is abstracted from the body.

The clinical thermometer, the general condition, and the sensations of patients afford a sure guide with regard to the extent to which external cold should be applied in any individual case; and the application of cold to the surface is certainly a rational measure of treatment in fever.

The amelioration of the nervous symptoms and the reduction of the pulse-rate, which usually follow reduction of temperature by external refrigeration, are arguments in favor of the view that these symptoms are mainly due to the pyrexia itself and not to the direct action of the special morbific agent which produces the disease.

Analogous effects are produced, although in a different way, by internal antipyretic remedies, of which antipyrin and antifebrin are now extensively used in this country in the treatment of fevers. The mode of action of antipyrin is not well understood, but its efficacy and value in reducing temperature are universally acknowledged. Extended and complete observations on the influence of this drug upon the elimination of excrementitious principles are as yet wanting, but the recent experiments of Umbach, in Berne, show that antipyrin has an important action in diminishing the excretion of nitrogen.[1]

Alimentation in fever. It is in accordance with accepted views concerning the physiological production of animal heat and its exaggeration in pyrexia, to supply food in fever, in such quantity as can be readily digested and assimilated, with a twofold object. The only possible objection to alimentation within the limits of assimilation would be clinical experience showing an increase in pyrexia or in other morbid symptoms; but clinical experience shows, on the contrary, that innutrition adds to the intensity of all the morbid phenomena characteristic of the disease. There is no disease in which the spectre of inanition is more prominently "a cause of death which marches in front and in silence" than in typhoid fever. An unusual physiological demand for heat is met by increased alimentation. The pathological increase in the production of heat in fever is attended eventually by destruction of tissue and results in degenerations.

The more prominent and important object of alimentation in fever is to supply or retard waste of tissue and degenerations. In so far as this end is attained, the ravages of fever are restrained. The disease having pursued its course, in proportion as its effects upon nutrition are restrained, the system is better prepared for rapid and complete convalescence.

A second object in alimentation, less prominent and important merely because more difficult and uncertain in practice, is to supply material for consumption, and thus far save destruction and degeneration of tissue.

The extent to which alimentation, therefore, is to be carried is limited only by the powers of the digestive system. Unfortunately, however, the degenerations and disturbances of function, which occur in fever, are prominent in the digestive organs. It is seldom, if ever, possible for a patient to assimilate food in sufficient quantity to repair the waste of tissue; but it is rational to endeavor to secure as much assimilation as is practicable. The difficulties in the way of efficient alimentation are due to degenerations of the glands of the

[1] Archiv für experimentelle Pathologie und Pharmakologie, Leipzig, 1886, Bd., xxi. Nos. 2 u. 3. According to these observations: "Antipyrin, like quinine and other antipyretics, materially lessens the elimination of nitrogenous matters, and can therefore be said to cause a decrease in the tissue changes of the respiratory and alimentary systems." Therapeutic Gazette, Detroit, September 15, 1886.

stomach, to which are frequently added, degenerations of the secreting cells of the salivary glands and pancreas. The practical skill of the physician is taxed to the utmost, in individual cases, to overcome these difficulties; but the judicious administration of milk, eggs, farinaceous articles, meat-broths, meat-essences, etc., is always productive of good results. A part of the nutritive constituents of these articles goes to repair the waste of tissue, and it is logical to conclude that a part supplies matter consumed in the production of heat. It is also rational to assume that, the repair of tissue being carried to the greatest possible extent, the hydrocarbons and fats must be useful in supplying material for those processes which are represented by the excessive elimination of carbonic acid. In no case of fever is it possible actually to accumulate fat in the system during the progress of the disease; and hydrocarbons and fats introduced must contribute to the formation of heat and thus restrict parenchymatous degenerations.

The disturbances which follow an alimentation carried to a degree beyond the powers of the digestive organs afford a reliable guide as regards the extent to which food should be introduced in fevers; and, in my judgment, too little attention and care have been given to the administration of articles of food which have a high heat-value, such as fatty and farinaceous articles.

As a digression, bearing, however, upon the question of the value of fats in conditions involving excessive production of heat, I may allude to their use in pulmonary phthisis.

I assume it to be settled that phthisis is produced by a special microörganism. One of the most prominent general phenomena of phthisis is a constant elevation in the body-temperature. When the disease is progressive, there is an increase in the heat of the body. When the disease is non-progressive, as indicated by physical signs, arrest of loss, and perhaps increase of weight and absence of bacilli from the sputum, the temperature of the body becomes nearly or quite normal. The pyrexia in phthisis is ordinarily not sufficiently intense to induce, of itself, serious disorders of digestion or much general disturbance; and the difficulties in the way of the assimilation of fats are usually not great. Leaving out of consideration, for the present, the effects of alcohol, there is no measure in the treatment of phthisis of greater recognized therapeutical value than the administration of fats.

The use of alcohol in fever. Alcohol is a substance, the toxic effects of which, taken in excess, are quickly and distinctly manifested; and there are few agents more prompt and decided in their influence in cases of disease. Clinically, the effects of alcohol in diseases in which there is a tendency to death by asthenia are so marked, that it is often used indiscriminately and injudiciously. In the treatment of fever the immense benefit which follows the use of alcohol in certain cases has led, at one time, to its use under all circumstances; and its indiscriminate administration, on the other hand, has produced, from time to time, a reaction of opinion, leading to its suppression in cases in which it would be of great service. Many of the moral arguments against the use of alcohol in disease are entirely illogical, and could, with equal want of propriety, be applied to a number of important articles of the materia medica. Alcohol is a potent agent in the treatment of fever; and the clinical guides which should direct its administration are easily recognizable.

In no case of disease, except, perhaps, in certain instances of poisoning by animal venoms, should alcohol be administered to a point where the slightest degree of alcoholic intoxication is apparent.

Alcoholic intoxication is due to certain peculiar effects of alcohol upon the nerve-centres; and in order to produce these effects the alcohol must circulate in the blood. As these effects pass off, the alcohol is either oxidized or is eliminated by the skin, lungs, and kidneys. Under normal conditions of nutrition, the effects of alcohol are so rapid and transitory, and are followed by such decided reaction, that it contributes little or nothing toward a prolonged resistance to cold. Experience has shown that it cannot take the place of an abundant and a highly fatty alimentation in excessive cold, as in the Arctic regions; and under these conditions its constant use has been found to be positively injurious. The same remark is in a measure applicable to all conditions of healthy nutrition. In a continued fever, however, the conditions are radically changed. In accordance with the views which I have presented, the excessive production of heat in fever is a fixed condition, continuing for a certain period, which is limited by the duration of the disease. The phenomena referable to the pulse, to the nervous system, etc., are secondary to the pyrexia. The parenchymatous degenerations are the more remote changes of tissue which follow and result from transformations involved in the long-continued excessive production of heat. If these views be accepted as correct, any readily oxidizable substance artificially introduced, will, if it be oxidized, mitigate the secondary effects of the fever upon the pulse and nervous system and retard degenerations, provided, always, that it do not increase the intensity of the pyrexia. Experience is not wanting to show that these results follow the judicious administration of alcohol in fever.

Inanition is also a constant element in a fever long continued. In health, the formation of water in considerable quantity, in the production of heat, occurs in the first part of a period of deprivation of food, and this saves, to a certain extent, destruction of the solid tissues. One of the most marked and constant conditions in fever is a disturbance of the heat-producing processes, in which the solid tissues are consumed and the production of water is greatly diminished. It is a rational object of treatment to endeavor to restore the normal equilibrium between the consumption of the so-called solids and the formation of water, as factors in the production of heat. If it were possible to introduce farinaceous and fatty articles of food in sufficient quantity in fever, it might not be necessary or desirable to use alcohol; but the condition of the digestive organs is such that these articles are slowly and imperfectly prepared for absorption. Alcohol, however, requires no preparation by digestion. It is promptly taken up by the blood, and is oxidized even more readily in fever than in health.

It is well known that saccharine and starchy articles of food, as well as the liver-sugar, rapidly disappear, and that starch is converted into sugar in digestion. In a remarkable paper by Dr. William Hutson Ford, a number of interesting experiments are published, showing the presence of alcohol in small quantity in the normal

blood, resulting, according to Dr. Ford, from the decomposition of sugar. In this paper, Dr. Ford makes the following statement:

"The destination of alcohol, whose presence in the economy I have thus demonstrated, must be to a hæmal oxidation or 'combustion,' as a main source of animal heat. This combustion is maintained, not only by glucose derived from amylaceous food, but likewise from the proximate products of change in the nitrogenous tissues."[1]

The thermal phenomena observed in diabetes mellitus are of much interest in connection with the theory that hydrocarbons are converted into alcohol, the oxidation of which is an important factor in the production of animal heat. In nearly all cases of diabetes there is a constant and persistent depression of the animal temperature. The principal pathological condition in this disease is manifested by a discharge from the body, in the form of sugar, of the hydrocarbonaceous elements of food; and, as a consequence, these substances are not used in the production of heat. The result is a constant depression in temperature, with a loss of weight which is often very rapid,[2] due to a consumption of the fatty and nitrogenized parts of the tissues, and certain parenchymatous degenerations which are observed particularly in the cells of the kidneys. It may seem paradoxical to say that diabetes is attended with a fever in which the temperature of the body is depressed. In progressive phthisis there is actually a fever, marked by elevation of temperature. In diabetes the fatty and nitrogenized parts are consumed to an abnormal extent, as in fever; but the heat-producing action of the hydrocarbons being suppressed, even this excessive consumption of fats and albuminoids is inadequate to maintain the normal standard of the bodily temperature. The theory that the hydrocarbons are converted into alcohol which is oxidized in the body is entirely in accordance with my view that the production of water is an important factor in the generation of animal heat. If alcohol be oxidized in the body, as it is in certain quantity, the production of water is inevitable. The heat-value of the hydrogen in alcohol being very great, and if—the hydrocarbons being discharged in the form of sugar in diabetes—the normal heat of the body be not maintained, the final oxidation of these hydrocarbons, with the consequent production of water, is an important factor in the production of animal heat. The excessive quantity of water discharged in diabetes probably comes in great part directly from the blood and the watery parts of the tissues, which accounts for the intense thirst always observed in grave cases of this disease.

In the administration of alcohol in the treatment of fever, we are really using the hydrocarbons in a form in which they may be immediately oxidized and do not require preparation by digestion. Thus we easily supply material to meet the excessive waste involved in the pyrexia, in much the same way as we administer peptonized albuminoids to meet the excessive waste of the nitrogenized parts of the tissues when the digestive powers are impaired.

It is a matter of universal clinical observation that there is great tolerance of alcohol in fevers and in pulmonary phthisis. This tolerance of an agent which is probably never useful in perfect health is strong evidence of a demand on the part of the system for the class of alimentary principles, the hydrocarbons, which alcohol represents; and it affords an absolute guide as regards the quantity that should be employed. The quantity which will be useful in individual cases may be small or it may be great. In certain exceptional cases, one or two ounces of spirit may be administered hourly for a day or two, with the best results; and this quantity may be taken without the slightest manifestation of alcoholic intoxication. With an alarmingly high temperature, a rapid and feeble pulse, and grave ataxic symptoms indicating impending death, alcohol may be given largely, but never to the extent of producing its characteristic toxic effects. In fever only such quantity of alcohol as is readily oxidized is useful; and any excess, which will certainly produce some degree of alcoholic intoxication and which must be eliminated as alcohol, will be productive of harm. In ordinary cases of continued fever it is seldom necessary or desirable to give more than eight or ten ounces of spirit daily.

I do not wish to be understood as advocating an indiscriminate use of alcohol in all cases of fever. Alcohol is indicated by an excessively high temperature, with the ataxic and other symptoms to which I have referred. In ordinary cases of typhoid fever, particularly in the early stages, it should be administered sparingly, cautiously, and tentatively. Its quantity should be reduced or it should be omitted at the first indication of alcoholic intoxication. Nevertheless, alcohol, judiciously administered, so that all that is introduced is promptly and completely oxidized, as it contributes material for consumption in the production of excessive heat, exactly in that degree does it retard destruction and degeneration of tissue, and it should be employed to supplement the use of matters that are regarded as nutritive.

In a paper published in 1879, I made a calculation of the heat-value of the ordinary brandy of the pharmacopœia, which I venture to quote:

"According to Brande,[1] cognac brandy contains 46 per cent. of absolute alcohol. With a specific gravity of 0.930, one ounce of brandy weighs 406.875 grains and contains 187.1625 grains of alcohol. The alcohol, with a composition of $C_4H_6O_2$, contains 12.9 per cent. of hydrogen, or 24.14 grains, and 56.65 per cent. of carbon, or 98.54 grains. The heat-value of 24.14 grains of hydrogen equals 214,77 heat-units. The heat-value of 98.54 grains of carbon equals 182.44 heat-units.[2] Taking, then, the total heat value of the hydrogen and car-

[1] Ford: The Normal Presence of Alcohol in the Blood. New York Medical Journal, June, 1872, p. 594.

[2] The history of a diabetic patient who consulted me in November, 1885, showed a loss of weight amounting in three years to 145 pounds. The patient was six feet three inches tall, and weighed, before the disease was recognized, 375 pounds. Under treatment for five days, the quantity of urine was reduced from 100 to 40 fluid-ounces, and the proportion of sugar from 27 to 2 grains per ounce. The patient then passed from under my direct observation, and the discharge of sugar was increased by indiscretions in diet. Ten months after, the patient wrote me that he "felt perfectly well," and had gained forty pounds in weight.

[1] Brande and Taylor: Chemistry, Philadelphia, 1867, p. 583.

[2] Mayer: Celestial Dynamics, Correlation and Conservation of Forces, N. Y., 1868, p. 261.

bon contained in one ounce of brandy, and taking no account of the oxygen contained, the heat-value amounts to 397.21 heat units.[1] If we assume that a man produces four heat units per pound weight of the body per hour, the amount of heat normally produced in twenty-four hours by a man weighing 140 pounds is equal to 13,440 heat units. The quantity of brandy required to supply this amount of heat, according to the calculations I have just made, would be a little less than 34 ounces. Theoretically, then, it is easy to see how alcohol may furnish material to supply heat and save waste of tissue in fevers. It is not very unusual in certain stages of fever, to administer from 16 to 32 ounces of brandy in twenty-four hours."[2]

I am deeply sensible of the great honor of an invitation to address this Congress. This invitation I felt bound to accept, although with a full appreciation of the responsibility which it involved and with much doubt and timidity with regard to my ability to do even a small measure of justice to the occasion. I have selected a topic of great present interest, which has been the subject of much fruitful study within the last few years. In discussing this subject, I have endeavored to apply the physiological methods of study which have lately contributed so largely to the advancement of pathology and therapeutics. I have been led by my reflections upon animal heat and fevers to present certain views which I venture, in conclusion, to summarize in the following propositions:

1. Fevers, especially those belonging to the class of acute diseases, are self-limited in their duration, and are due each one to a special cause, a microörganism, the operation of which ceases after the lapse of a certain time.

2. We are as yet unable to destroy directly the morbific organisms which give rise to continued fevers; and we must be content, for the present, to moderate their action and to sustain the powers of resistance of patients.

3. The production of animal heat involves oxidation of parts of the organism or of articles of food, represented in the formation and discharge of nitrogenized excrementitious matters, carbonic acid and water.

4. As regards its relations to general nutrition and the production of animal heat, water formed in the body by a process of oxidation is to be counted as an excrementitious principle.

5. Fever, as observed in the so-called essential fevers, may be defined as a condition of excessive production of heat, involving defective nutrition or inanition, an excessive production and discharge of nitrogenized excrementitious matters and carbonic acid, with waste and degeneration of the tissues, and partial or complete suppression of the production and discharge of water.

6. Aside from the influence of complications and accidents, the ataxic symptoms in fevers, the intensity and persistence of which endanger life, are secondary to the fever and are usually proportionate to the elevation of temperature. These symptoms are ameliorated by measures of treatment directed to a reduction of the general temperature of the body.

7. The abstraction of heat by external cold and the reduction of temperature by antipyretics administered internally, without affecting the special cause of the fever, improve the symptoms which are secondary to the pyrexia.

8. In health, during a period of inanition, the consumption of the tissues in the production of animal heat, is in a measure saved by an increased production and excretion of water.

9. In fever, the effects of inanition, manifested by destruction and degeneration of tissues, are intensified by a deficient formation and excretion of water.

10. Alimentation in fever, the object of which is to retard and repair the destruction and degeneration of tissues and organs, is difficult mainly on account of derangements of the digestive organs; and this difficulty is to be met by the administration of articles of food easily digested or of articles in which the processes of digestion have been begun or are partly accomplished.

11. In the introduction of the hydrocarbons, which are important factors in the production of animal heat, alcohol presents a form of hydrocarbon which is promptly oxidized, and in which absorption can take place without preparation by digestion.

12. Precisely in so far as it is oxidized in the body, alcohol furnishes matter which is consumed in the excessive production of heat in fever, and saves destruction and degeneration of tissue.

13. The introduction of matters consumed in the production of heat in fever, diminishes rather than increases the intensity of the pyrexia.

14. As the oxidation of alcohol necessarily involves the formation of water and limits the destruction of tissue, its action in fever tends to restore the normal processes of heat-production, in which the formation of water plays an important part.

15. The great objects in the treatment of fever itself are to limit and reduce the pyrexia by direct and indirect means; to limit and repair destruction and degeneration of tissues and organs by alimentation; to provide matters for consumption in the abnormal production of heat; and thus to place the system in the most favorable condition for recuperation after the disease shall have run its course.

[1] It is well known that the heat-value of certain elements in combination is less than of the same elements in a free state, as was shown by the experiments of Favre and Silbermann, made many years ago; but with regard to alcohol, the difference is only about one-third of one per cent. Favre et Silbermann: Annales de chimie et de physique, 3me sèrie, Paris, 1842, tome xxxiv. p. 357, and Milne Edwards: Leçons de physiologie, Paris, 1863, tome viii. p. 25.

[2] Flint: Experiments and Reflections upon Animal Heat. American Journal of the Medical Sciences, Philadelphia, April, 1879, p. 362.

THE EXPERIMENTAL METHOD IN SCIENTIFIC MEDICINE AND ITS RELATIONS TO BACTERIOLOGY.

An Address delivered in General Session, September 7, 1887.

BY PROFESSOR MARIANO SEMMOLA,
OF NAPLES.

GENTLEMEN: Honored by an invitation to deliver before you a General Address, I feel at once the duty of expressing to you my recognition of an honor superior to my modest merit, and I am obliged to ask your indulgence in the task, since I desire rather to bring to you the greeting, entrusted to me by my Government,

than to appear as worthy to take a prominent part at this feast of medical science. In the name of Italian Medicine, I greet you, my illustrious colleagues of the United States, representatives of the progress of medicine in the New World; and first, I thank you for the courtesy with which you have received me.

An humble son of Italy, I have always longed to see Italian medicine adorned with its worthy title, therefore, when invited, by your country, to address you, I thought I could best merit the esteem of scientific men, and prove myself a worthy child of Italy, by demonstrating one of the greatest discoveries of modern medicine, namely, the experimental method, which was born with Galileo, in Italy, and which has been the only loadstone of her scientific discoverers.

On the banner of ancient medicine was inscribed the motto "Conserve strength and cure disease." This motto should be the talisman of every student of medicine to guard him from the evils of idle, but scientific curiosity. It is easy to see that because there are sick there are physicians, and this continued existence of both classes has occasioned the sarcasm, "Physician, heal thyself," which fully expresses the irony of public opinion regarding unsuccessful medicine. I can conceive of a physician or chemist who is not an artisan, or a botanist who is not an agriculturist, but I cannot conceive of a physician who does not study to cure the sick, because a physician's study is inexorable, and, also, is his true and only mission; for myself and other thinking men, the true test of medical progress is the great or small number of patients rescued from death. This standard may seem prosaic, but it is the bare truth, and this truth renders medicine one of the most important factors in civilization, because wherever men strive for a common aim, medicine is a common interest. "Mens sana in corpore sano" is the true expression of human felicity. Whatever man's condition, his greatest care is to preserve strength and life; sickness and death represent disorder, anguish, and desolation in the household. Family ties are ties of a community, and the death of an individual may alter the destinies of a nation.

In no other branch of science is there so ardent a desire to solve unsettled problems as in medicine. We naturally hope to reach the solution of the problems of healthy and morbid activity, and this hope ever reappearing, has inspired mankind through all ages, and will do so in the future. From Hippocrates to Koch and Pasteur, from the age when man believed himself to possess the knowledge of the Infinite to the present, when analytical research threatens to extinguish all sentiment, for twenty centuries the human mind has struggled through a maze of misapplied reasonings, until it has emerged into the clear light of a critical observation and positive scientific and experimental research. Actual progress in physical and chemical science began in the seventh century, when those discoveries were made which rendered possible the subsequent development of biology as one of the experimental sciences, a development destined to save medicine from the wreck which had befallen other branches of human knowledge. After centuries of darkness a light dawned, destined to guide the steps of the votaries of medical science. This beacon light, gentlemen, was experiment, the objective method as contrasted with introspection and deduction. As Bertholiet has said: "The world is not to be conceived by guessing, but by observing." The progress of experimental science is an epic poem whose chief actor is humanity subduing nature.

When evolution pauses, revolution starts the onward march, and such excessive energy may be tolerated when in science or in politics the occasion demands; but natural evolution is consecutive as well as progressive, and he who would push onward must stop within the bounds of natural evolution. This harmony of evolution and revolution is the law of the existence of good and evil, a principle underlying not only science, but the very being of humanity in its different phases. Medicine, like the other sciences, has attacked the innermost citadel of nature, and demands the secrets of life and death; she aspires to mathematical precision, and would enunciate laws whose observance shall be binding upon her votaries. What a golden age for humanity will be the consummation of this hope! It will not be said of medicine then: "Ars medendi, sed ars semper sanandi." He whose therapy fails to reach this point has failed in attaining the object of his art and walks in fruitless quest, attaining nothing; such is history's teaching. The early traditions of therapeutics have preserved to us, through the ages, the first treasures of medicine in mercury, quinine, and iodine; nor have all the discoveries of modern medical science equalled in the treatment of some of the most severe diseases, this foundling child of empiricism. *We affirm, then, that the experimental method in medicine has for its purpose the determination of the phenomena of nature and their causes.* The experimental method admits no individual dogmatic authority, nor has it anything in common with the theories of hypothetical methods. The individual loses his personal authority in comparison with the teachings of demonstrated science. As Goethe has well said: "There is no channel of communication between mind and matter but experience."

Observation and coördination of facts and the formulating of laws is the natural sequence. The experimental method is composed of three elements, observation, the formation of hypotheses, and their verification. The individual often hastens to spread abroad a new discovery, not waiting to prove it, thus injuring, by his premature action, the cause of truth which he seeks to serve. Pascal has described such men by saying: "They never seek causes themselves, but only the way of finding them." Ostrich-like, the framer of a false hypothesis in science hides himself behind the confusion of ideas, while his failure is apparent. Medicine then must proceed in the path which we have narrated, if it will regenerate itself; from this rule there are no concessions, no exceptions. Finally, there must be either empiricism old or new, or an experimental science.

The problem assigned to medicine is very simple; to determine the conditions of vital existence and its phenomena in healthy and diseased organisms. It is not my purpose to describe the application of the experimental method to physiology, by which so many facts of clinical importance have been ascertained. To reach this degree of certainty, it needed more than half a century of study, without counting the precious foundations which biology had prepared for it since the last century. It is sufficient to remember that from the biological chemistry of the blood we now know little or

nothing at the utmost; and the ontological notions which seem to be most correct, are threatened by a revolution since the recent researches of Angelo Mosso, a son of Italy. And we have probably to begin anew.

Scientific and experimental medicine proposes to itself to discover the conditions of existence of the phenomena belonging to life, or to regulate the determination of them, and these are to be the columns of Hercules. Medicine, like all other sciences, never demands why, well knowing that the first causes of things are inaccessible, and that to every scientist it should suffice to know in which physical and chemical conditions this or that phenomenon manifests itself, so that he can modify and govern it at his will.

Which are the phenomena that the physician studies? The answer is the functional disturbances or symptoms of sickness. What are the physical and chemical conditions of these phenomena? The natural causes of the sickness? This is the most simple form of the pathological problem. To arrive logically at the third part of the solution, is the most difficult: that is to say, how can these physical and chemical conditions be artificially modified in disease to reproduce normal physical and chemical conditions, or to make disappear the phenomena of disease and cause a return of the normal functions? It is enough, generally, to announce this series of problems to discourage investigations. This honest confession would appear to me the best introduction to the future scientific medicine. And there is no help. If the scientific medicine has to be constituted, this is the logical progression of its steps. Beyond this orbit all is empiricism and ignorance, because there does not exist any half science or conjectural science. Following this way the physician has had already the experience of the physicist and chemist, who knew profoundly the existence of natural phenomena, and then modified them, turning them to his profit; the physician has to gauge the stupidity of this sentence, which we hear repeated nowadays, and which he himself often abuses, in the name of badly understood progress, that "Man commands nature."

Now, in reality, the scientific man and also the physician, if he determines to be, and not merely appear, a physician, instead of commanding nature, is to obey her. Let the manufacturers ask themselves who are the legitimate sons of scientific progress; let them ask Franklin, Stephenson, Daguerre, Edison, and other great benefactors of humanity. Yes, it is true they have governed the lightning, they have permitted man almost to annihilate distance, they have given to him the lighthouse of the universe, and controlled the lightning flash, and caused the electric light to rival the sun. But they were worthy and faithful priests of science, and made no pompous promises; they did not discover all the secrets of the phenomena which they undertook to study. If a single link of the long chain of their researches had not been elaborated, no one of you can doubt that the chain would certainly have been broken at the test, and the wonders prematurely announced would have fallen as nothing. Here is what distinguishes inexorably true scientific and experimental progress.

In biology, and especially in the progress of the pathology and therapeutics, this fundamental principle is very often forgotten. And this forgetfulness seems to me to be the true cause which has paralyzed until now the useful results of the immense mass of researches made in the field of medical science.

In experimental science, isolated facts are an idle and dangerous luxury, and in medicine, the isolated and scattered riches cannot produce by themselves useful progress in clinical study. The doctor at the bedside of his patient, after a minute analysis, *needs a synthesis to form a proper opinion, and without synthesis even a most learned doctor is useless to his patient.* In reality, then, we are spectators and authors of really barbarous methods. It amounts to but little that one system be constructed in the name of a hypothesis, and another in the name of a fact; and you will still say it little matters if these systems are called vitalisms, rather than cellular pathology, or bacteriology.

At the present time, medicine unfortunately continues to be the victim of system, and the system of to-day is bacteriology. For those who love sincerely the progress of medicine, it seems to me to be but little charity to hide this dangerous reality, as it would be undoubtedly childish, if not dishonest, to ridicule the great teachings which are included in the discoveries of modern times of a true microörganism continuously at war with man. It is true that in the pages of high genius, like Brieger, Klebs, Sternberg, and others, it is stated distinctly how, for the present, the limit is to be fixed to this new era of pathology and therapy; but the current of mediocrity overwhelms all, conquers the masses, and inspires then absolutely those who now have no science and who are ready to cry "Hail!" to-day to Christ and to-morrow to Mahomet. The only reason which has permitted a systematic invasion most attractive in its domination, of cellular pathology, is the complete forgetfulness of the laws of the experimental method in the progress of medicine. Without pretending to seek the prophets of bacteriology in the poem of Lucrezeio ("De natura rerum") or in the "Contagium animatum" of the Middle Ages, I will only say that the idea of living microscopic germs which insidiously penetrate the human organism by way of the lungs, stomach, and skin, and are capable of developing definite diseases, is not new; it was already presented to the mind of the physician in former times under another name; and it would suffice to remember the universal panacea of camphor, which, more than half a century ago, held in check for a long time a good part of the medical faculty.

But these trials do not deserve any credit for the effective progress of micro-biology, of which the first light is owed, undoubtedly, to Cagniard Latour, who formally announced that if brewer's yeast fermented sugar, this was the same as the generation of life. No one could have believed in those times—1825—that in these words would be included the embryo of one of the most fortunate natural discoveries of the nineteenth century. I do not purpose here to tell you through what rigorous and scientific ways this great discovery has advanced, and what obstacles it had to conquer. I can remember that the memorable researches of Colin and Davaine, in 1851, on the bacteria of carbuncle, and those of Pasteur on the transformation of lactic acid to butyric acid (1861) and on the silkworm disease, have been the starting-point of the scientific modern movement. Researches more memorable, inasmuch as they show that when science walks, without overstepping

herself, on the path of rigorous experience, she will arrive at unfailing and lasting results.

The works of Rüdinger who was the first to presume to scan the vast horizon which opened before scientific medicine in regard to physical and chemical conditions necessary for the development of microbes, should suffice to define in a precise manner the favorable and necessary conditions to the development of the common mould fungus, known under the name of Aspergillus niger. He demonstrated that the slightest trace of nitrate of silver in the proper culture medium would be sufficient to hinder the development of these mould fungi. He should have infused in investigators a great reserve and a great prudence, but for more than ten years microbiology instead of advancing with measured and secure steps, pretends to become, itself, pathology. It was a true whirlwind, enveloping all and, at the side of precious discoveries like that of the bacillus of anthrax, of tuberculosis, and some others which are an honor to science, came forth from every part microscopical researches on the existence of new microbes in all diseases, and every sickness seems to have found its true germ, destined, perhaps, to die before being registered. For the past five or six years one could not open a paper without finding registered the discovery of one or more new pathogenic microbes. I have to say that while attention remains so distracted by many problems unsolved in pathology, the easiest way to enter into the path of celebrity has been, and is, the announcement of some new microbe or some new bacillus. Pathology has come to be proclaimed almost the same as bacteriology. Every clinician finds it indispensable to open at the side of his hospital ward a laboratory for bacterial culture. On one side of the hospital is a room for the cultivation of bacteria; and on the other is a room for patients, and the expenses of the first are often greater than the allowance for food for the second.

These discoveries are proclaimed on all sides as the true foundation stone of biology, and doctors hasten with eagerness to proclaim that the only end for cure in sickness is inoculation of microbes, or at least to prepare the organism for surviving the work of the cure by inoculation.

It would be a superfluous work in this place to state the ridiculous childishness which filled the minds of those, who finding it more convenient not to follow the thorny path of the experimental method, attached themselves eagerly to the organ of any new idea, believing that this would be enough to confirm themselves as progressive men. The learned and honest student who has to-day a desire for knowledge would only have to pass in review the strange cures which have been proposed for diseases in the last ten years and note the progress of events, to doubt his own eyes! All these curative propositions were made and are still repeated in the homage of scientific medicine. It is sufficient to recall the trials which were made in many clinics with the most poisonous parasites, to kill the bacilli of tuberculosis in consumptives, aggravating, instead, their miserable existence. It is enough to remind you of carbolic acid and salicylate of soda advanced as sure remedies to abort yellow fever and cholera. On the other hand, one must not be unjust and doubt the honesty of a progressive man because a certain theory has failed to make itself felt among those who put the organism at its greatest disadvantage by applying dangerous preparations of pharmacy, useless according to the teachings of the laboratory, to inoffensive processes. The use of one poison, whether bacillus or drug, to drive out another is irrational and highly injurious, as shown by statistics. Man lives surrounded by microörganisms, over which he triumphs, as he does over the material world.

The biology of the present must solve the problem of man's relation to these microörganisms and the source of their power. Bacteriology has gone beyond its premises, beyond its point of start, and is an unworthy invasion in the field of evolution. I have found the air by analysis full of microbes, but as yet we possess no test as to their being injurious or harmless germs. We cannot ascertain correctly the soil in which microbes grow nor their mode of life, and hence one factor of the problem remains unknown. The claim of Klebs to discriminate between a poisonous germ and a large family of non-poisonous germs seems unproven. Plants are edible in proportion to their cultivation and soil, not differing morphologically from their poisonous fellows; and if an analogous condition holds good with microbes, the reasoning of the bacteriological method is false. In disease where several microbes are present, we cannot discover which is the fatal one. Observers are too ready to assert that diseases following inoculations are produced by the germ; and I appeal to all lovers of truth to determine if possible which diseases are dependent upon inoculation and which are not. Who has seen malaria, or diphtheria, or any disease, in which it was *proven* that the disease depended upon the microbe? Rodents, ruminants, and some other living organisms, show predilection for anthrax; but the carnivora are exempt from many diseases caused by germs. Davaine and Koch failed in some attempts to transfer certain germs from one animal to another. What positive demonstration can they furnish of the causation of disease? Our physical and chemical knowledge of the blood of different animals is so small that we have no means of knowing what animal furnishes a suitable soil for the growth of these microbes. The chemistry of the tissues of an animal is the true basis of judgment of its inoculability or non-inoculability by germs. This, I think, no scientific man will doubt.

I do not see in modern methods of bacteriological research the true experimental method. Diseases are produced by inoculation, but are these morbid processes dependent upon the germ or upon the soil in which it is implanted? Demonstration by this method fails; nothing is positively proven; and in the majority of cases common good sense pronounces against the attempted proof. If this method be correct, physiology must be suppressed or reversed. Suppose a man, when sweating, should enter a cave and remain there several hours, contracting a violent acute rheumatism, do you mean to say that I must seek the cause of his disease in a microbe, or did a profound derangement of the physiological conditions occasion the disease? If I find a few microbes, shall I not consider them the effect and not the cause of the disease? In osteomalacia and endocarditis acuta the relation affirmed to exist between the microbe and the disease has not been proven. This failure illustrates the failure of this method when applied

to the true experimental study of disease. Staphylococcus aureus, when injected into the bloodvessels, will cause general infection, but not osteomalacia purulenta.[1] If, after inoculation, a bone be broken and osteomyelitis purulenta occurs, I ask, in the interest of scientific men, if this occurrence proves the causation of the terrible disease in the helpless animal by the microbe? Endocarditis purulenta is not caused by the injection of microbes; the insertion of a sterilized sound through the carotid artery will cause injury and endocarditis with all its results. So many factors enter into the solution of the problem, that I regret, for experimental medicine, that such hasty observations should be considered of value.

The unknown quantity is too large a factor to be ignored, and any method which disregards it is too much like the utterances of the Delphic Oracle to be considered by thinking scientific men. The true therapeutics will be that science of medicine which shall relieve suffering with the certainty of success. Malignant pustule has occurred when the point of infection is removed; and a similar reasoning is applicable to typhoid fever. In phthisis, the terrible disturbances of nutrition in the patient are the principal factors of the disease, whatever the bacteriologists may say to the contrary; if the patient could rid himself of the bacilli, his life could not be saved. In the absurd miracles chronicled by surgical bacteriologists, the differences between defective antisepsis and curative antisepsis seem to me almost childish. Lister's discovery will doubtless remain an endless source of fame to him, and one of the treasures of the last half of the present century. But Lister's cleanliness closes the doors to poisonous materials which older surgeons had allowed to remain open through their carelessness. It is absurd to quote the success of Lister as an argument for the use of parasiticides. The destruction of microbes outside of the body by antiseptics is no criterion of judgment by which to estimate the success of intracorporeal disinfection. We recognize our inability to prove the entrance of germs by the many avenues open to them, and my long clinical experience leads me to the positive conviction that bacteriology is greatly beyond its reasonable assumptions.

I have shown how bacteriology has exceeded its proper limits, and I now desire to call your attention to its detrimental influence upon pathology. The true part played by bacteria in pathology is the production by them of certain noxious and decomposed elements of the blood, which substances, and not the bacteria, are the potent factors in the causation of disease. The treatment of the physical and chemical constitution and conditions of the blood is a much more fruitful field for study and investigation than a direct attack by germicides upon the bacteria. The human body in health is a laboratory in which are constantly conducted chemical activities of the most complicated nature, and this is doubly true in disease; the action of the pharmacopœia may be best explained by the effect of these substances upon the chemical composition of the elements of the body. The new school of experimenters in therapeutic medicine, among whom Nencki, Husemann, Gussenbauer, Kobert, and Georgi have given especial promise of brilliant results, have investigated sufficiently to refute the reasonings of the purely bacteriological experimenters. The securing of the proper chemical conditions of the body is the object of this school; in other words, to put the organism in harmony with that universe, created by chemical atoms, by which it is surrounded. We are led to follow the counsel of the hygienist, and say, preserve your health, conserve your strength, and disease will affect you but little. Science will show us the particular physical condition of the body which renders us open to the attack and lodgement of a particular microbe.

Hereditary phthisis is well known, as a convenient example of the chemical conditions of the body predisposing to infection by microbes, and the presence or absence of these conditions explains the personal immunity or liability to the disease. The statement that the predisposition to phthisis is not dependent on chemical conditions of the tissues, is the exchange of one ignorance for another. We do not know how to remedy this condition of the tissues which predisposes to the lodgement of the tuberculosis bacillus, except by hygienic strengthening treatment, food, and all exercises which tone, and strengthen, and increase the organism. Unhappily, we cannot ascertain in the laboratory what peculiar changes there are in the tissues which sometimes enable an animal, already attacked by tuberculosis, to endure further infection, and finally conquer the infection. What comparison can there be between the slight changes occurring in an animal deprived, in the laboratory, of fresh air and proper food and care, and the slow, but extensive, changes of tissue which go on in the human being, although apparently the individual is in good health? Physiologically and bacteriologically considered, between these two conditions there is an abyss. Science recognizes this, but has not the means of closer approximating to the truth. The most delicate chemical tests do not demonstrate the intermediate conditions of the organism which have rendered possible the lodgement of a bacillus. What has been said of tuberculosis can also be predicated of all diseases said at the present day to be caused by bacteria. The assertion that a good culture soil is present in those persons who are susceptible to smallpox, scarlatina, and other diseases of their kind, explains nothing.

What are we to say regarding the immunity which the first attack of parasitic diseases causes from a second? The theory that the first attack exhausts the soil favorable for bacteria, we cannot accept, because there is no reason why this material should not speedily reaccumulate after recovery. How are we to explain those cases of scarlatina which recur several times after the first attack in infancy? It is a mystery. How do we explain the fact that one case of scarlatina runs a typical course and recovers, and another case lingers with diseased glands and joints. I admire the ingenuity of bacteriologists, and I bring forward this statement to show in its true light, that their assumptions are not the corner-stone of a new clinical philosophy; but that no matter how germs may grow in broth or in the potato, we know as little from them as before. If you do not accept the chemical changes in the body which constitute a predisposition to tuberculosis, you may bid farewell to scientific conceptions of morbid processes. There can exist no superstructure of medicine, however

[1] Weichselbaum: Klinische Zeit und Streit Frag. Vienna, 1887.

true, however false, upon this foundation. One must remark with Victor Hugo, "I looked for an edifice, and I found a ruin!" In the itch insect we see the result of local irritation in furthering the spread of the mischief. A slight change in general nutrition and hygiene is often sufficient to secure the loss of the insect and the return of the person to health. In what way could these simple changes have influenced the chemistry of the tissues sufficiently to cause a repulse of the parasite? I believe that science should honestly confess its inability to solve these problems. Excepting the better known and stronger substances used in medication, we can say nothing certain regarding scientific therapeutics at the present day; and medical science is content to remain satisfied with the little which is known about the substances mentioned. The advance-guard of science represents the fly upon the oxen's back urging his huge bearer to plow.

The dictum of modern therapeutics is, that remedies are given to destroy germs; but by the same reasoning mercury is given for syphilis and quinine for malarial fevers, while the direct existence of disease germs has not been proven in either case. The assertions of the modern school are proof of the injurious domination of a mistaken idea, and adherents of these theories imagine that they see in the patient the germs which they behold on looking through the microscope. The fact that solutions of bichloride of mercury in strengths of 1 to 1000 and 1 to 4000 are efficient germicides, proves nothing regarding their effect upon the germ of syphilis, for the following reasons: It is commonly thought that bichloride of mercury combines with the albumen of the tissues and their sodium salts, to form combined albuminates of mercury; and that these compounds act upon the albumen in the syphilitic germ, which is impossible when the mercury has exhausted its combining powers in its first combination. To avoid these contradictions pharmacologists form a hypothesis. If we admit that mercury kills syphilitic microbes, it does so in a solution of 1 to 5000. To combat successfully the germs of syphilis it would be necessary, by calculation of body-weight, to give a patient fifteen grains of bichloride of mercury, an amount, I need not say, which would be fatal in its results. Following this calculation, it would also be necessary to give at least sixty or eighty hypodermatic injections daily in the treatment of syphilis, representing in all from five to six grains of the bichloride of mercury. If we remember that after the third or fourth injection, traces of albuminates of mercury are found in the urine, we shall see that the whole amount necessary to complete the natural cure must be very great. Following the same reasoning, why should not mercuric chloride cure tuberculosis? There is no necessity for reviving a theory followed with such sad results. Empiricism has no place in the temple of medical science—it is a dead issue.

The true experimental philosophy, seeking the causes and acting from truth thus derived, has made its healthful influence felt not only in medicine but in social science. To you Americans the experimental method is that not only of science, but of your government and its institutions. With empirical anarchy you have nothing in common. The great facts of clinical observation transmitted through centuries, are the precious basis of modern medical science. It is the duty of the physician, at present, to apply to these great stores of knowledge the clear light of the chemistry and physics of the present; its anatomy, pathology, and physiology, and thus to deduce rules of action for the investigation of new facts and new truths which arise in the clinical observations of to-day. In such a manner only can we hope worthily to contribute through an extended period of time, to the solid structure of truly scientific medicine.

Let use see to it that we adhere rigorously to the sound principles of correct observation, that we may avoid the errors of past ages and not stray from our onward path through the false light of erroneous hypothesis or extravagant generalization. Thought should be national in its true freedom and catholicity. Science knows no fatherland, and as long as it is fearless to conquer, will enlist under its banner the peoples of the earth. Each nation contributes characteristic studies to the accomplishment of the whole. To nations who look back to grand traditions, the remarks of Virchow, at the Congress of Naturatists at Hanover, in 1886, are particularly appropriate: "Science is unproductive when it has no national character," and that "Germany herself says that this scientific progress consists only in following her example—imitate no one if you wish to revive your science and reach your former grandeur." From no other corner of the earth could my humble voice reëcho more powerfully the history of my fatherland's experimental medical science than from America. Let us follow faithfully the banner of science, taking for our motto that message which the physician of the Egyptian army sent to Napoleon, "It is my duty to conserve and not to destroy."

MEDICAL PROGRESS.

A NEW COLORING MATTER IN URINE.—LEUBE reports that he has found a coloring matter in the urine of those suffering from osteomalacia, cystitis, and nephritis, which turns on exposure to the air from dark violet to black. This amorphous substance dissolves in ether; it is separated by dilute alkalies, not by acid; the alkaline solutions are at first reddish-brown and afterward yellow. This coloring matter is soluble in hot water, chloroform, and benzol. The alcoholic solution is decolorized by zinc, but assumes its color on exposure to the air. The solutions show characteristic spectra or flourescence.—*Fortschritte der Medicin*, July 15, 1887.

PERITONITIS PRODUCED BY FOREIGN BODIES.—PERNICE has made experiments by injecting small quantities of concentrated mineral acids, acetic acid, carbolic acid, a concentrated solution of bichloride of mercury, and nitrate of silver into the abdominal cavities of puppies and young pigs; peritonitis followed, and sometimes necrosis and intestinal perforation. The peritonitis was serous or sero-fibrinous, without suppuration. In the exudate was a form of micrococcus, generally diplococcus or chain bacterium, which liquified gelatine. These bacteria probably come from the blood of the animals, for they were found in the blood of healthy animals, and abundantly in the air of the laboratory and stalls where the animals were confined. Pure cultures of these bacteria produced no peritonitis.—*Centralblatt für klinische Medicin*, July 16, 1887.

THE MEDICAL NEWS.

A WEEKLY JOURNAL
OF MEDICAL SCIENCE.

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SATURDAY, SEPTEMBER 10, 1887.

THE INTERNATIONAL MEDICAL CONGRESS.

As will be seen from our Washington dispatches, the Ninth International Medical Congress was duly opened in accordance with the announced programme, and is in the midst of its sessions as we write. It has been favored with almost perfect weather, and its members have had the opportunity of seeing one of our most beautiful cities under exceptionally favorable conditions of sky and air.

A part of the work of the Local Committee of Arrangements has been well done, the rooms provided for the different Sections were sufficient and well located, and the arrangements for registration were satisfactory, except for a few hours during the greatest rush. The part relating to entertainments, we regret to say, however, was not so satisfactory, as may be inferred from the statement of the Chairman of the Committee to the Congress on Wednesday morning, in which he referred to "the humiliating spectacle of Monday night," and spoke of the foreign guests as having been "engulfed in a mob at the President's," both of which expressions were more than justified by what occurred.

On the other hand, it is with great pleasure that we call attention to the admirable manner in which the Secretary-General has performed the onerous and difficult duties of his office. To the signal executive ability and unwearying zeal of Surgeon-General Hamilton is due, in a large degree, the measure of success which the Congress has attained.

Great complaint has been made by the Local Committee and others, as to the insufficiency of funds for social entertainments, excursions, etc , and this deficiency has been, with questionable justness, attributed to the parsimony of Congress, which has been freely denounced in consequence. The fact is, however, that at only two of the preceding Congresses has any grant of money been made by the Government of the country in which the meeting was held, and the largest of these grants—*i. e.*, that made by Denmark—was precisely that given by Congress, viz., $10,000. Municipalities have in three cases voted funds for entertainments, but the chief source of supply has always been private contributions, as it should be. Certainly, in the beginning, no governmental aid was expected, and it was so stated at Copenhagen, when the invitation was presented to the Executive Committee of the last Congress. The complaints referred to are in very bad taste, and can in no way excuse the mismanagement of the social features of the Congress.

The number of persons actually present is upward of 2500, and of these about 130 are from abroad. A number of the foreign members were registered by mail, and were not in attendance. The election as vice-presidents of a number of foreign gentlemen who were known not to be present, or even regis ered, was in opposition to all precedent, and was not a wise or dignified proceeding.

As to the character of the work done, the amount of new and valuable information which has been presented, and the probable influence which these will have on the science and art of medicine in the future, it is perhaps too soon to venture comment or prediction, but the opinions expressed by a few prominent men, which we print elsewhere, are interesting in this regard. The preliminary programme announced about five hundred papers as having been promised. Quite a number of these were not on hand when called for, but there were many others offered which were not on the programme, and it is safe to say that each member of the Congress will be entitled to receive several very bulky volumes in the shape of its transactions, and that the editors of these volumes are not to be envied.

The American profession has desired to extend a most cordial welcome to the foreign members who honored us by their presence at Washington, and it is a source of gratification to find that so many of our guests have shown their appreciation of this sentiment by bringing with them scientific contributions which cannot fail to add materially to the merits of the Congress as an educational gathering.

A feature of the Congress has been the attention given to it by the daily press, and the likenesses given in the Washington papers of men whom they consider specially worthy of honor form a collection which is unique in medical portraiture.

We evince our own interest in the Congress by devoting this entire number, which contains sixteen extra pages, to the report of its proceedings.

PROFESSOR FLINT'S ADDRESS.

IN the choice of the subject of Fever, upon which to address the Congress, Dr. Flint was peculiarly happy, as he not only had an opportunity of discussing a scientific problem of the deepest interest, but he was also able to deal in a very practical manner with principles of treatment of everyday importance to the practitioner.

The theory of fever advanced by Dr. Flint has, in certain respects, the merit and attraction of novelty. He would define fever, as observed in the so-called specific diseases, as a condition of excessive formation of heat, involving defective nutrition, an excessive production and discharge of nitrogenous matters, with wasting of the tissues and *partial or complete suppression of the production and discharge of water*. This latter proposition forms the central point in his theory. Physiological considerations, which are dealt with at length, indicate that water is formed in the body by the union of oxygen and hydrogen, and is often discharged in excess of the water of food and drink. This water is a product of oxidation, an excretion which may be compared with urea and carbonic acid, and its formation is closely connected with the process of calorification. In health this production of water with the generation of heat "seems to carry with it the conditions for equalization of the animal temperature by cutaneous transpiration." In simple inanition and in excessive muscular exertion there is an increased discharge of water, the formation of which economizes the tissues of the body, and in these conditions, were it not for this increased formation of water and the cutaneous transpiration, the temperature of the body would be raised. In pyrexia with an increase in the discharge of carbonic acid and urea, there is a diminished formation and excretion of water, and it is the suppression or reduction of these important processes which allows the rise in temperature.

Dr. Flint's views on the rational treatment of fever follow naturally, and are based upon the physiological considerations. Clinicians will read with great interest his remarks on the value of alcohol as a food in fever. It presents a form of hydrocarbon which is readily absorbed and promptly oxidized, and saves destruction and degeneration of tissue. And as in its oxidation water is formed, its action in fever thus "tends to restore the normal processes of heat production, in which the formation of water plays an important part."

The question of fever presents many difficulties, and before we can expect a full and clear explanation of its pathology, we must know more of the laws regulating the formation and discharge of heat in health. The views here announced are valuable as based on careful physiological observations, and though some of the conclusions will excite opposition and may be open to criticism, there can be no doubt that Dr. Flint has given us a most suggestive contribution to this complicated subject.

THE HYPODERMATIC USE OF ERGOTIN.

IN hemorrhage inaccessible to mechanical means of arrest, the hypodermatic use of some form of ergot has proved one of the most successful of therapeutic expedients. In puerperal hemorrhage the abdominal wall was chosen as the place of injection, and the fluid extract of ergot and various preparations of ergotin have been employed. This mode of treatment, however, is not without unpleasant results in an irritative effect of the drug, producing pain, and often abscesses.

To avoid these objectionable features, BUMM, in an article in the *Centralblatt für Gynäkologie*, No. 28, 1887, strongly urges the selection of the nates as the place of injection; the needle of the hypodermatic syringe should be inserted perpendicularly in the gluteal muscles for its entire length. The muscular tissue is shown to be less sensitive and more efficient as an absorbent than the subcutaneous tissue; experiments upon animals show that twelve hours after such injections all traces of the fluid disappear, while portions of material injected into the abdominal wall remain for more than twenty four hours.

A second point of importance is the choice of an appropriate preparation of ergot. Bumm believes that the strongly acid reaction of the extracts and their solutions is an important factor in the production of the burning pain so often caused by injections. The suggestion of other writers, that the power of the drug is impaired by neutralization of its solution, Bumm did not find verified in the cases of two patients whom he treated for uterine fibroids, using in alternation acid and neutral solutions. The addition of soda to full neutralization gave a clear fluid which was perfectly efficient.

The use of too concentrated solutions is another cause of irritation. Ordinarily one part of ergotin to five of water is recommended, but much more rational is the selection of a five or ten per cent. watery solution. A better result is obtained from a larger quantity of a weaker solution, both as regards rapidity of absorption and continued action, than from a smaller quantity of a stronger solution. A slight sensation of burning, or tenderness on pressure, are the only unpleasant after-effects which Bumm has seen to persist, and for a few hours only, after this treatment.

THE Crown Prince of Germany has written to Professor Virchow, announcing a continued improvement in the condition of his throat, and thanking the renowned pathologist for his investigations

into the character of his Imperial Highness's malady.

It is reported that the Queen has intimated her intention of conferring the honor of knighthood upon Dr. Morell Mackenzie in recognition of his professional services to the Crown Prince.

THE American Gynecological Society will hold its annual meeting at the hall of the Academy of Medicine, in New York, on Thursday, Friday, and Saturday, of next week. Dr. A. J. C. Skene, of Brooklyn, is the President for the year.

AT the meeting of the American Dermatological Society, held at Baltimore, last week, Dr. I. E. Atkinson, of Baltimore, was elected President for the ensuing year.

ACCORDING to a press cablegram there were reported last Tuesday 6 new cases of cholera and 2 deaths in Rome, 13 new cases and 10 deaths in Palermo, and 27 new cases and 18 deaths in Catania.

AN epidemic of scarlet fever is now prevailing in London. The fever hospitals are reported to be full of patients, and up to September 7th, 1120 cases had been reported to the health authorities.

SOCIETY PROCEEDINGS.

NINTH INTERNATIONAL MEDICAL CONGRESS.

Held at Washington, September 5–10, 1887.

(Specially reported for THE MEDICAL NEWS.)

MONDAY, SEPTEMBER 5TH.

GENERAL SESSION.

THE Congress was called to order promptly at 11 o'clock, by the Chairman of the Executive Committee, HENRY H. SMITH, M.D., of Philadelphia. He said it was known to all present, as well as to physicians throughout the world, that in May, 1884, representative members of the profession in the United States decided to send a fraternal greeting to the Eighth International Medical Congress, then about to assemble in the capital of Denmark, and ask that the Ninth International Medical Congress might meet in the city of Washington. This invitation being accepted, an executive committee was named to make the necessary arrangements, and the result of their labors was seen in this large assembly, which the register showed contained many of the most brilliant and distinguished medical minds of Europe, Asia, and America. To welcome these guests of the profession, and show his interest in a great humanitarian object, the President of the United States had consented to open the Congress for organization.

The President arose, and when the applause had subsided, he said:

"I feel that the country should be congratulated today upon the presence at our capital of so many of our own citizens and those representing foreign countries who have distinguished themselves in the science of medicine and are devoted to its further progress. My duty on this occasion is a very pleasing and a very brief one. It is simply to declare that the Ninth International Medical Congress is now open for organization and for the transaction of business."

ELECTION OF OFFICERS.

The Chairman of the Executive Committee then nominated Dr. N. S. Davis, of Chicago, for President of the Congress, and he was elected by acclamation, and Dr. Francesca Durante, of Italy, and Deputy Surgeon-General Jeffry A. Marston, of the British Army, were appointed a committee to escort him to the chair.

Dr. J. B. Hamilton, Supervising Surgeon General of the United States Marine Hospital Service, having been nominated and unanimously elected Secretary-General of the Congress, took his place and nominated the following gentlemen as

VICE-PRESIDENTS OF THE CONGRESS.

United States.—Surgeon-General Moore, U. S. A.; Surgeon-General Gunnell, U. S. N. (ex-officio); Dr. William Brodie, Detroit; Dr. W. W. Dawson, Cincinnati; Dr. A. Y. P. Garnett, Washington; Dr. Edward M. Moore, Rochester; Dr. Tobias G. Richardson, New Orleans; Dr. Lewis A. Sayre, New York; Dr. Joseph R. Smith, New York; Dr. J. M. Toner, Washington.

London.—Dr. Cuthbert H. G. Bird; Dr. A. Pearce Gould; Mr. Ernest Hart; Dr. Jonathan Hutchinson; Sir James A. Hanbury; Sir William Jenner; Dr. Fred B. Jessett; Dr. William H. Lloyd; Dr. William Murrell; Dr. Jeffrey A. Marston; Mr. Thomas J. MacLagan; Dr. John Marshall; Dr. Morrell Mackenzie; Dr. William A. MacKinnon; Dr. Charles D. F. Phillips; Mr. Richard Quain; Sir John W. Reed, K. C. B.; Mr. William H. Savory; Sir Edward H. Sieveking; Dr. John Tweedy; Sir Henry Thompson; Sir William W. Gull.

England.—Dr. J. Ewart, Brighton; Sir B. Walter Foster, Birmingham; Sir Thomas Longmore, Netley; Dr. John D. MacDonald, Surrey; Dr. Withers Moore, Brighton; Sir William Roberts, Manchester; Dr. John B. Sanderson, Oxford; Mr. Lawson Tait, F.R.C.S., Birmingham; Sir John Tomes, Surrey; Dr. George M. Humphrey, Cambridge.

Scotland.—Dr. McCall Anderson, Glasgow; Dr. Thomas Annandale, Edinburgh; Dr. John Chiene, Edinburgh; Dr. T. R. Fraser, Edinburgh; Sir Douglas Maclagan, Edinburgh; Dr. George H. B. Macleod, Glasgow; Sir William Turner, Edinburgh.

Germany.—Dr. William Koch, Berlin; Dr. Frederick Esmarch, Kiel; Dr. A. L. Gusserow, Berlin; Dr. W. D. Müller, Berlin; Dr. Carl von Mosengsill, Bonn; Dr. G. Unna, Hamburg; Dr. Waldeyer, Berlin; Prof. E. Winckel, Munich.

France.—Dr. Dujardin-Beaumetz, Paris; Prof. A. Charpentier, Paris; Dr. A. Chervin, Paris; Dr. Vallin, Paris; Prof. Trelat, Paris; Dr. Léon Le Fort, Paris.

Austria.—Prof. Carl Braun, Vienna; Dr. Ehrendorfer, Vienna; Dr. Hans R. von Hebra, Vienna.

Switzerland.—Dr. F. Dumont, Berne; Dr. Theodore Kocher, Berne.

Italy.—Dr. Francesco Durante, Rome; Dr. O. Morisani, Naples; Dr. Mariano Semmola, Naples.

Egypt.—Dr. J. A. S. Grant-Bey, Cairo.

Halifax.—Dr. Thomas M. Dolan.
Ottawa.—Dr. J. A. Grant.
Havana.—Dr. Nicholas Jose Gutierrez.
Copenhagen.—Dr. Wilhelm Meyer.
Honolulu.—Dr. John S. McGrew.
Belgium.—Dr. Leopold Servais, Antwerp.
Dublin.—Sir William Stokes.
East Indies.—Dr. George J. H. Evatt.
Hague.—Dr. J. E. de Virij.

The President of the Congress put the question, and the gentlemen named were elected by acclamation.

A Delegate.—Mr. President, I would like to ask, sir, if it is proper to elect as Vice-Presidents those who are not members of the Congress. I protest, and move to amend—

President Davis.—It is hardly proper to interrupt the proceedings now. It was impossible to know who would be here in person. Gentlemen named were notified, and all accepted the places. The list as read is elected, and I have the honor to invite the Vice-Presidents to seats on the stage.

The following gentlemen were then elected

PRESIDENTS OF SECTIONS.

General Medicine, A. B. Arnold, M.D.
General Surgery, W. T. Briggs, M.D.
Military and Naval Surgery, Henry H. Smith, M.D.
Obstetrics, DeLaskie Miller, M.D.
Gynecology, Henry O. Marcy, M.D.
Therapeutics and Materia Medica, Traill Green, M.D.
Anatomy, W. H. Pancoast, M.D.
Physiology, J. H. Callender, M.D.
Pathology, A. B. Palmer, M.D.
Diseases of Children, J. Lewis Smith, M.D.
Ophthalmology, J. J. Chisolm, M.D.
Otology, S. J. Jones, M.D.
Laryngology, W. H. Daly, M.D.
Dermatology and Syphilography, A. R. Robinson, M.D.
Public and International Hygiene, Joseph Jones, M.D.
Climatology and Dermatology, Albert L. Gihon, M D.
Psychological Medicine and Diseases of the Nervous System, J. B. Andrews, M.D.
Dental and Oral Surgery, Jonathan Taft, M. D., D.D.S.

The Congress then confirmed the selection of the remaining officers of the Congress.

THE REPORT OF THE SECRETARY-GENERAL

was then read by Surgeon General Hamilton. According to the practice at former associations of this body, the Secretary must make a report of the work performed since the session of the Congress last preceding. In doing this it was his aim to occupy as little time as possible.

He said it was now a matter of history that in May, 1884, the American Medical Association met in this capital and passed a resolution inviting the Congress to honor America by holding its next session in the United States. At the meeting in Copenhagen, when the question came up for disposition, Washington was selected. The committee, having borne the invitation and secured its acceptance, returned home and immediately began the work of organization. Shortly before the meeting of the American Medical Association in New Orleans in May, 1885, the preliminary organization was completed. But it transpired that this committee was unable to form an organization satisfactory to the majority of the members of the Association, and after some discussion a resolution was adopted which authorized the appointment of additional members of the committee so as to include, in accordance with our American system of representation, one member from each State and Territory, and to these were added one representative from the Army, the Navy, and the Marine Hospital Corps. The enlarged committee met in Chicago, and a majority of the first committee was present and acted harmoniously with the new committee. In a short time, however, the members of the original committee withdrew and the management was thus deprived of their valued services. The committee had to contend against more than the ordinary difficulties attending so great an undertaking. The time was too short to speak adequately of the multifarious labors attached to the office of the Secretary-General, but he had to report that at the present moment there remained no unfinished business on the Secretary's table. The work of organization was now complete, and he submitted the programme and the volume of abstracts.

In regard to the programme, he stated that the rule requiring titles and abstracts of papers to be read to be in the hands of the Secretary-General before the 30th of April, had not in a single instance been complied with. Owing to this delay, the work of publication had been done in a hasty manner, and of necessity at the expense of many errors.

The contract for printing the volumes of *Transactions* has been let, and the work will be done with as much dispatch as possible.

Dr. A. Y. P. Garnett, of Washington, Chairman of the Committe of Arrangements, then announced

THE SOCIAL PROGRAMME

of the Congress.

Monday evening, there would be a conversazione at the United State Pension Building.

On Tuesday, the President of the United States will hold an informal reception at the Executive Mansion, from 8 to 9 P.M., after which the members will proceed to visit the Corcoran Art Gallery.

On Wednesday afternoon, from 4 to 6, the Hon. Josiah Dent will give a lawn party, to be attended only by those who receive cards of invitation.

On Thursday there will be a reception and banquet at the United States Pension Building, from 8 to 11, at which it is hoped that the President of the United States and his Cabinet will be present.

On Friday, the Secretary of the Navy, Mr. Whitney, will give a reception at Grass Lands, his country residence.

On Saturday, there will be an excursion to Mount Vernon for the foreign members and their families only, the United States steamer "Dispatch" having been kindly granted by the Secretary of the Navy for this purpose. In the afternoon, an excursion train will start for Niagara Falls and Watkin's Glen, also for the foreign members and their families, who will be conveyed free of charge. American members may also attend at the excursion rate.

In conclusion, Dr. Garnett remarked that it was a

source of profound regret and embarrassment to the Committee that the month of September had been chosen as the time of meeting, and it was their painful duty to explain to the visiting members that they had come to a city literally and almost entirely deserted of its inhabitants, who were thus prevented from displaying the hospitality for which they are justly noted.

THE SECRETARY OF STATE'S ADDRESS OF WELCOME.

THE PRESIDENT, DR. DAVIS, then introduced to the Congress the Hon. Thomas F. Bayard, Secretary of State, who welcomed the Congress in the following address:

"*Gentlemen of the International Medical Congress:* The pleasing duty has been assigned to me of giving expression, in the name of my fellow-countrymen, to the gratification felt by us all that you should have selected this Capital to be the scene of your Ninth Congress, and cordially to bid you welcome.

"The world is becoming better acquainted, social assimilation has progressed, small provinces and minor kingdoms are federalizing into great empires, international intimacy suffers less obstruction, the broad and powerful current of literature is silently wearing away the banks of geographical prejudice, and a spirit of a common brotherhood, of mutuality and independence is expanding itself irresistibly over the barriers of mountain and sea, and these new and beneficent conditions give promise that the word 'stranger' shall soon be obliterated from the vocabulary of civilization.

"You gentlemen will not, I hope, feel—and I am sure you will not be considered by us—as strangers in the United States; for not only has the fame of many of your number—whom to name might seem invidious—long since surpassed the limits of your own lands and been recorded in the world's annals of scientific attainment, but I take leave to say that here especially will your claims for public respect and grateful acknowledgment due to your enlightened services find prompt and hearty allowance by the populations who dwell amid the blessings of civil and religious liberty beneath the broad banner of these United States.

"If letters be a republic, science is surely a democracy, whose domain is penetrated and traversed by no royal road, but is open on all sides and equally to all, who with humility and intelligence shall watch and wait for light as it is gradually disclosed by divine Providence for the amelioration of mankind.

"In this democratic republic the brotherhood of science can best realize its universality; for here you will find institutions for the promotion of science in every department—and in none more conspicuously than in that of medicine and surgery—the most important of which are the voluntary gifts of private citizens, men who, in the great majority of cases, were painfully limited in their associations with science and letters, who began life at the lowest round of fortune's ladder; but, thanks to the noble equities of our political system, rose without 'invidious bar' to the highest level of material success and public usefulness.

"To the public spirit and benevolence of such individuals is due the endowment, on a scale that princes may envy, but have never surpassed, of schools of science, colleges, and universities, open for the intellectual training and advancement of all who desire to share and are competent to receive such benefits.

"Your Congress is held, gentlemen, in the year of the first century of our national existence, and what has been here accomplished in the line of scientific education and equipment owes comparatively little to official or governmental assistance. To no system of prescriptive privilege, but to individual energy, enterprise, and generosity, we owe what, under God, we now possess of such things, and non-interference by the Government has proved a promotion and not a hindrance in our advancement. Busy in every department of industrial pursuit, engrossed with diversified occupations, and hurrying with a breathless energy that has left its traces upon the physiognomy of our people, yet, believe me, we are not deaf to the calls of humanity nor lacking in appreciation and grateful respect for the votaries of science.

"We welcome this Congress as guardians of the sanitations of the nations. In your profession we recognize the noblest school of human usefulness, and in the progress of the development of the laws of cure, the mitigation of suffering, the prolongation of human existence, and the efforts to discover the true principles of conditions by which life can be made 'worth living,' we have learned to appreciate our debt to those whose highest reward is the 'still small voice of gratitude' and consciousness of benefaction to the human race. Gentlemen, I confidently promise your convention a worthy audience—not alone the members of your profession here assembled nor the limited number whom this building can contain—but that vaster audience to whom, upon the wings of electrical force, your message will be daily borne far and wide to the listening ear of more than sixty millions of American citizens.

"Sure am I that your message will be worthy and equally that your thoughtful deliverances will be welcomed by a continent.

"The close relations of mankind which modern invention has induced has been necessarily accompanied by an increased dissemination of disease and the need is obvious of frequent international conference, that in the grand sweep of scientific observation new discoveries in the healing art may be promptly tested and applied in counteraction.

"Forgive me if, as one of the great army of patients, I humbly petition the profession that in your deliberations Nature may be allowed a hearing when remedies are proposed; that her *vis medicatrix* may not be omitted in computing the forces of cure, and that Science may be restricted as often as possible to sounding the alarm for nature to hasten, as she surely will, if permitted, to the defence of the point assailed.

"My duty is very simple, and I fear I have already overstepped its limit, for there was indeed little more for me to say than to repeat the words of an ancient dame whose cottage was close by the battlefield of Waterloo, and, being somewhat deaf, and hearing the sound of the artillery when the famous 'pounding' was hardest, thought she heard some one knocking at her door, and simply said: 'Come in.' This may seem an unscientific illustration of auscultation and percussion, but you need not make half the noise of Wellington or Bonaparte, and I can assure you the American

people will hear you and heartily say to you, as I do for them, 'Come in.'"

RESPONSES BY FOREIGN DELEGATES.

Inspector-General WILLIAM H. LLOYD, R. N., returned thanks on behalf the medical profession of Great Britain and Ireland, as represented by his professional brethren present, for the warm and eloquent welcome to which they had listened from the Secretary of State. He expressed thanks and appreciation of the kind and cordial welcome received from the Congress, and for the honor conferred by the presence and approval of the high officers of State of this truly great country.

DR. LÉON LE FORT, of Paris, said he appeared in the name of his countrymen to express their thanks for this welcome. They had crossed the Atlantic to bring to their American colleagues an expression of their sympathy. The reception accorded had already proven that the sympathy was reciprocated. In designating Washington for the Congress the medical profession of Europe desired to affirm the high esteem in which American physicians are held.

DR. P. G. UNNA, of Hamburg, returned thanks on behalf of his German colleagues for the very friendly words with which they had been welcomed. The German physicians who had come to the United States had been most handsomely received. Not only had they found in all parts of the country men educated in German colleges in all the branches of medical science, but they had learned with pride that here German science was appreciated, and that here it had gathered a rich harvest. He begged to convey the assurance that the German members of the Congress would do their best to make the meeting a success.

SENATOR M. SEMMOLA, of Naples, said he was happy to have the honor of replying in the name of Italy and of bringing the salutation of his young and great nation, which regards with profound interest the marvellous growth of this edifice of independence—the United States. He believed international congresses to be among the best means of binding peoples together in liberty, equality, and fraternity, and he flattered himself that this Congress would be a striking example of the invincible power of humanity, marching—science and liberty allied—toward that condition of social peace which was inspired in the United States and would always be a shining mirror of the patriotism of this great people.

DR. CHAS. REYHER, of St. Petersburg, said he would hardly dare to speak were it not made his duty to do so. He would not be understood if he spoke in Russian, and his familiarity with English was very limited. He and all who came with him expected to see and learn much, but they had seen and learned far more than they had hoped. He expressed his hearty thanks for the welcome.

Dr. N. S. DAVIS then delivered

THE PRESIDENTIAL ADDRESS.

Gentlemen and members of this Congress: It is my first duty on this occasion to remind you that death has removed from among us one to whom, more than to any other, we are indebted for the privilege of having the Ninth International Medical Congress in America, one whose urbanity, erudition, valuable contributions to medical literature, and eminence as a teacher caused him not only to be universally regarded the most influential leader in all the preparatory works, but also the one unanimously designated to preside over your deliberations on this occasion. That one was the late Professor Austin Flint, of New York, who was taken suddenly from his earthly labors early in 1886, before the preparations for this Congress had been half completed.

The true nobility of his private and professional character, his ability as a teacher, and the number and value of his contributions to the art and science of medicine had caused him to be known and esteemed in all countries. And, as you well remember, that, while the shock of his death was fresh upon us, his loss seemed well-nigh irreparable. But, though he has taken his departure, ripe in years and full of honors, yet the influence of his excellent example and of his contributions to medical science remain, and will continue to exert a beneficent influence through all the generations to come.

With a full consciousness of my own deficiencies, and still with a heart overflowing with gratitude, I thank you for the honor you have bestowed in selecting me to preside over this great and learned assembly. It is an honor that I appreciate as second to no other of a temporal nature because it has been bestowed, neither by conquest nor hereditary influence, nor yet by partisan strife, but by the free expression of your own choice.

Addressing myself now more directly to those here assembled, who have left homes and loved ones in other lands and encountered the fatigue and danger of travelling by sea and by land, in the name of the Medical Profession of this country I welcome you, not only to this beautiful city and the hospitality of its citizens, as has been so admirably done already by the honorable representative of the Government, who has just taken his seat, but I cordially welcome you to the open arms and warm hearts of the medical men of this *whole country*, in whose name you were invited here three years since, and whose representatives are now here, side by side with you, gathered from the East, the West, the North, the South, as well as from the rugged mountains and fertile valleys of the Centre, to make good the promise implied by that invitation.

If they do not cause you to feel at home and happy, not only in the social circles and halls devoted to the advancement of science, literature, and art in this city of our Nation's pride, but wherever you may choose to roam, from the rocky coast of New England on the Atlantic to the Golden Gate of the Pacific, it will be from no want of earnest disposition to do so.

He then urged that no other one influence operative in human society during the present century has done as much to develop and diffuse medical knowledge, to stimulate its practical and successful application, both in sanitary measures for preventing disease and in the direct alleviation of suffering at the bedside, and in unifying and ennobling the profession itself, as has been accomplished by the aggregate medical society organizations of the world. Yet their capacity for conferring other and perhaps still greater benefits, under proper management, will have become manifest in the near future. And that he might accomplish the chief object of this address, he asked indulgence while he indicated some of the more important additional benefits in ad-

vancing medical science and saving human life through the instrumentality of our medical society organizations, and the methods by which they may be accomplished.

These latter, briefly stated, consisted in the addition to every permanent general medical society, of two standing committees; one, to which should be referred for critical examination every communication claiming to embody a new discovery in either the Science or Art of Medicine; and the other should be charged with the work of devising such lines of investigation for developing additional knowledge as require the coöperation of different individuals, and perhaps societies, and of superintending their efficient execution until crowned with success.

It has been tersely and correctly stated that associated action constitutes the characteristic and predominating power of the age in which we live. It is by associated action that education in its broadest sense, religion, and civilization have been more rapidly diffused among the masses of mankind during the present century, than during any other period of the world's history. It is by the association of capital, wielded by the associated intellects of the nineteenth century, that the highways of commerce have been opened over the valleys, through the mountains, across the deserts, and on the oceans, over some of which the material productions of the nations are borne by the resistless power of steam, and along others the products of mental action are moved with the speed of electric currents, until both time and space are so far nullified that the most distant nations have become neighbors, and the inhabitants hold daily converse with each other from opposite sides of the globe. Indeed, it is only by means of such of these highways as have been constructed within the memory of him who addresses you, that you have been gathered in this hall from the four quarters of the earth, and through which an account of your doings may be daily transmitted to your most distant homes.

In concluding he said, I congratulate you on the fact that the profession you represent has taken the lead of all other professions or classes of men, in rendering available these grand material achievements of the age for cultivating fraternal relations, developing and interchanging knowledge, and planning concerted action for rendering human life everywhere healthier, happier, and of longer duration.

This is the ninth grand International Congress in regular series within little more than two decades, and let us hope that all its work will not only be done in harmony and good order, but with such results as will add much to the aggregate of human happiness through all the coming generations.

Without trespassing further on your patience, I must ask your forbearance with my own imperfect qualifications, and your generous assistance in the discharge of the responsible duties you have devolved upon me.

The Congress then adjourned to meet in Sections at 3 P. M.

SECTIONS.

General Medicine.

The Section was called to order at three o'clock in the Congregational Church, by THE PRESIDENT, A. B. ARNOLD, M.D., of Baltimore, who, after briefly announcing the method to be pursued in the working of the Section, said that the occasion which afforded him the privilege of addressing the representative men of our profession seems not inappropriate to cast a retrospective glance at the methods which exert a dominant influence on the medical practice of the present day. An inquiry concerning the extent and the value of our therapeutical resources under changing circumstances, even if very imperfectly carried out, will not be deemed wholly uninteresting to the reflecting physician. He then referred to the lack of confidence displayed by some on the one hand in the reception of advanced methods of investigation or treatment, and the too hurried adoption of them by others. Candid and competent criticism is evidently the only safeguard against the overweening confidence in favor of therapeutical measures, as well as the best corrective of irrational scepticism.

Although we would naturally expect unanimity of opinion in regard to the treatment of febrile affections which are self-limited, or, at least, display a tendency toward recovery: yet he thought he did not exaggerate when he asserted that there is an English, a French, a German, an Italian, a Spanish, and an American method of treating fever. It may be safely said, however, that the rate of mortality of fever has steadily diminished during the last four decades.

The therapeutics of typhoid fever was then made the topic of special consideration. Although the most beneficial results have been reported from the artificial depression of the accelerated pulse and respiration, yet the essayist did not think the methods have been demonstrated as curative in their results. Hyperpyrexia is an unquestioned danger in fever, and the methods for overcoming it were briefly reviewed by the essayist. We are now more than at any previous time able to meet the causal indications of the disease in our treatment, and we know at the same time more of the method in which our therapeutic measures attain their effects. Hydrotherapy, for example, has its effect through the vasomotor nerves. Nature often cures disease, and a knowledge of her methods of so doing enables us the more scientifically to supplement her efforts in that direction.

In conclusion, he remarked that it is hardly conceivable that medical science will ever attain that degree of perfection which would render it competent to formulate a system of practice that would leave little to the discretion of the physician. A certain independence of action will always be unconsciously exercised. Medical talent in the hands of the brightest ornaments of the profession often assumes a character akin to the inspiration of genius. The display of diagnostic acumen, the mastery of difficulties and perplexities, and the promptness of decision in the presence of urgent realities, constitute accomplishments and performances which rival the brilliant achievements of co-workers in other branches of our profession.

DR. YGNACIO ALVARADO, of Mexico, then read a paper entitled

SOME SUGGESTIONS ON THE PATHOGENESIS OF YELLOW FEVER.

It would appear, he said, pretty well established that the symptoms of yellow fever are due to the presence and action of microbes. It is also a striking fact not altogether new, that there is a strong analogy existing

between the symptoms of this disease and those produced by lactic acid poisoning, on the one hand, and phosphoric acid on the other. To determine the reality of the poisoning by these agents in this disease is extremely difficult, and would require an extraordinary degree of knowledge and skill in chemical manipulations. Assuming, however, that the microbe to whose action is due the manifestations of the disease, by its action on the sugar which it finds in the blood, and more especially in the liver, produces a lactic acid fermentation, that this lactic acid, combining with the phosphate of soda in the organism, occasions the setting free of phosphoric acid, we have the phenomena which occur pretty satisfactorily explained. That the formation of lactic acid occurs is indicated, he held, by the pathological lesions which occur in the disease.

He then reviewed briefly the more prominent lesions of yellow fever as found upon autopsy, consisting for the most part in rapid fatty degeneration of the liver, the coats of the stomach, extending well out along its vessels, sometimes resulting in hemorrhage, the kidneys, and brain, in all of which he traced the analogy to phosphoric acid poisoning. Poisoning by this agent, he added, causes the blood to become acid, just as it is found in yellow fever. The symptoms of the disease were then reviewed more fully, and the address closed with a short *résumé* of the treatment of the disease, including a number of experiments.

DR. WALTER P. GEIKE, of Ontario, Canada, then read a paper on

PNEUMONIA AS MET WITH IN VARIOUS PARTS OF THE DOMINION OF CANADA.

The first point he endeavored to establish was the frequence with which the disease occurred in various parts of the Dominion. In the furthest western portion, especially in the Westminster district, acute primary pneumonia is comparatively rare. It is much more frequently a secondary disease, complicating for the most part typhoid fever. Coming a little further eastward, it is said not to be common. Is this not, he inquired, because the settlers are as yet few in this region? In this part, too malaria, which is so important a factor in its influence upon all diseases, but especially this one, is not found. It occurs in the acute form in scattered settlements, assuming the more protracted form in the cities and in rapidly growing settlements. In the southern parts of Ontario, malaria is a frequent complication of the disease. The disease also tends to assume a low form. In Toronto, for instance, where malaria frequently complicates the disease, a low form is frequently encountered, which renders the prognosis much more grave. In many cases the disease seemed to be contagious, or perhaps more properly, the specific fever accompanying the disease appeared to be contagious. That the adynamic form of the disease should supersede in frequency the more acute form, is a striking fact. He admitted that in many cases the exhausted condition of the system from alcoholic or other excesses was responsible for this apparent inconsistency. But he thought bad drainage had more to do with the production of the disease than any other factor.

Coming to the province of Quebec, we learn that in Montreal pneumonia is frequent and is generally acute in form, unless when it affects enfeebled persons or those of intemperate habits. The very low form, thought by some to be contagious, is said to be very rare in Montreal, and its presence there as an epidemic is strongly questioned, as throughout the great Northwest malaria is not met with. There is little doubt that to the absence of malaria as well as to the similarity of climate is due the fact that pneumonia presents so many of the same features in these widely separated districts, in Quebec on the one hand, and in the Northwest on the other. The cases of pneumonia seen in New Brunswick, in Nova Scotia, in Newfoundland, and in Prince Edward's Land are the same. In conclusion, he said that it would be entirely too wide a field for the present occasion to introduce the question whether the disease is a local one or is the local expression of a specific infection.

Dr. Geike, in conclusion, stated that he did not consider pneumonia more frequent in malarial districts than elsewhere but when complicated by malaria the disease presents a much altered character and a higher mortality.

The Section then adjourned.

GENERAL SURGERY.

The Section met in the Congregational Church and was called to order at 3 P.M. by the President DR. W. T. BRIGGS, of Nashville, Tenn., who in a brief address of welcome opened the Section for work.

DR. CHARLES T. PARKES, of Chicago, presented a paper on

GUNSHOT WOUNDS OF THE ABDOMEN.

No subject has interested surgeons, he said, more than the treatment of penetrating wounds of the abdomen. In 1885 the whole number of recorded cases of operation for gunshot wounds of the intestine was but six. Since 1885, thirty-eight cases have been recorded with eleven recoveries, and surgical interference in appropriate cases is now the generally accepted view. The condition and appearances of the external wound give some indication as to presence or absence of penetration. A single wound of the abdomen affords a hope that the penetration has not taken place, but it is only a hope. Even the presence of a wound of entrance and exit does not positively indicate injury of the viscera. If there is a tract of tenderness continuous from the wound of entrance some distance, it is fair to infer that penetration does not exist. A large bullet-hole indicates penetration. When in doubt the wound of entrance should be enlarged. In this way the presence or absence of penetration can be determined, and with the usual precautions this does not increase the dangers.

In diagnosis much value cannot be attached to the subjective sensations. The unusually rapid appearance of tympanites in a region ordinarily dull, would indicate escape of gas into the abdominal cavity. Localized dulness in the region of the wound or in the dependent portion of the abdomen would indicate hemorrhage. The presence of blood in the urine indicates wound of the kidney, bladder, or ureter. Shock cannot be relied upon, but when present the probability of such injury is very great. The rare phenomenon of feces in the wound is a positive sign of perforation. The presence of persistent nausea and vomiting

also points to injury of the viscera. The absence of pulsation in one femoral vein indicates injury of the iliac vessel. Two cases were then reported.

In the treatment of gunshot injuries of the abdomen, incision in the median line is better in the majority of cases. There are exceptional cases in which enlargement of the original wound answers the purpose. The continuous suture answers every purpose, and as it can be inserted more rapidly than the Lembert, it is preferable. Silk is preferable to catgut in making the sutures. Where resection is required, two methods of procedure may be adopted. In cases where the mesenteric border cannot be saved, section should be made through the healthy bowel, and a triangular portion of the mesentery also removed. The two portions of the bowel are then brought together and secured with sutures, the first suture being introduced at the junction of the mesentery and intestine. In no case had he found it necessary to use more than one row of sutures. All raw surfaces should be covered with peritoneum. The second method is applicable in cases where the mesenteric border is not injured. In these cases the section does not involve the mesenteric border of the intestine. The injured portion is alone removed and the edges of the healthy bowel brought together with the continuous suture. Where the omentum is injured the hemorrhage is often severe, requiring the removal of a large portion of the structure. All slits and lacerations in the omentum should be closed by sutures. In perforation of the stomach there is no difficulty in closing the wound after it is found. Where there is no complication wounds of the stomach usually heal satisfactorily. In gunshot wounds of the liver the surfaces should be brought together by deep sutures. The same procedure may be employed in the case of the spleen, but where this organ is badly lacerated extirpation is indicated. Perforating wounds of the kidney call for extirpation. Perforation of the liver, spleen, or kidneys with a similar injury of the small intestine greatly increases the gravity of the case, and such cases will usually end fatally. Wounds of the bladder call for suture.

Special stress was laid on the necessity of seeking out all wounded bloodvessels, thus preventing the danger of primary or secondary hemorrhage. There should be a careful search made for all wounds of the intestine, the bowel being examined in a systematic manner. Tight sutures should be avoided, for these will lead to sloughing and extravasation. If the peritoneal surfaces are laid in contact and kept there for a few hours, adhesions will take place.

DR. N. SENN, of Milwaukee, then read

AN EXPERIMENTAL CONTRIBUTION TO INTESTINAL SURGERY, WITH SPECIAL REFERENCE TO THE TREATMENT OF INTESTINAL OBSTRUCTION.

The indications in the treatment of intestinal obstruction are to remove or render harmless the cause of the obstruction, and the immediate restoration of the continuity of the intestinal canal. Where the cause cannot be removed, it is to be rendered harmless by forming an anastomosis between the portion of bowel below and that above. One hundred and fifty operations were performed on animals. The principal forms of intestinal obstruction were produced artificially, and the attempt was made to devise some new operation whereby the obstruction may be relieved when the removal of the cause is not possible. The length of time required in the performance of most of the present operations is their great contraindication. By simplifying the method of operation, the author had been able to lessen the time required. To prevent extravasation during the progress of the operation, the author had employed a narrow rubber band tied around the intestine with sufficient force to occlude it. He had never observed any injurious effects following the use of elastic compression.

The study was first directed to simple *stenosis*, which was produced by cutting out a semilunar portion of the bowel. (*a*) Traumatic stenosis from this cause becomes a source of danger from obstruction or perforation where the lumen of the bowel is reduced more than one-half. Where excision of the bowel is required for injury not more than one-half should be taken away. If more is required, circular excision should be resorted to. Longitudinal suturing of wounds on the mesenteric side of the intestine should never be practised, as such a procedure is invariably followed by gangrene and perforation, through interference with the blood supply of the portion of bowel corresponding to the mesenteric defect. (*b*) In circular constriction of the bowel, the immediate cause of gangrene of a loop of intestine is obstruction to the venous circulation, and takes place first at a point most remote from the cause of the obstruction.

Flexion (*a*) produced by partial enterectomy and transverse suturing of the wound. On the convex surface of the bowel, a defect an inch in width can be closed by transverse suturing without causing obstruction by flexion. In such cases the stenosis is subsequently corrected by a compensating bulging of the mesenteric side of the bowel. Closing a wound of such dimensions on the mesenteric side of the bowel by transverse suture, may give rise to intestinal obstruction by flexion, and to gangrene and perforation by seriously impairing the blood supply to and venous return from the portion of bowel corresponding with the mesenteric defect. (*b*) Flexion caused by inflammatory and other extrinsic causes, gives rise to intestinal obstruction only in case the functional capacity of the flexed portion of the bowel has been diminished or suspended by the causes which have produced the flexion, or by subsequent causes independently of the flexion.

Volvulus, as in flexion, gives rise to symptoms of obstruction when the causes which have given rise to a rotation upon its axis of a loop of bowel, have at the same time produced an impairment or suspension of peristalsis in the portion of bowel which constitutes the volvulus, or when a diminution or suspension of peristalsis follows in consequence of the rotation.

Invagination. Accumulation of intestinal contents above the seat of invagination, is one of the most important factors in preventing spontaneous disinvagination and in inducing gangrene of the intussuscipiens. Spontaneous reduction is not more frequent in ascending than in descending invagination. The immediate cause of gangrene is obstruction to the return of venous blood by constriction at the neck of the intussuscipiens. Ileo-cæcal invagination when recent can frequently be reduced by distentions of the colon and rectum with water, but this method of reduction must be practised with great care and gentleness, as over-distention of the colon and rectum is productive of multiple longi-

tudinal lacerations of the peritoneal coat, an accident which is followed by the gravest consequences. The competency of the ileo-cæcal valve can only be overcome by over-distention of the cæcum, and is effected by a mechanical separation of the margins of the valve, consequently, it is imprudent to attempt treatment of intestinal obstruction beyond the ileo-cæcal valve by injections per rectum.

In a study of the effects of *enterectomy*, it was found that in dogs, resection of more than six feet of the small intestine was uniformly fatal, the cause usually being the immediate effects of the trauma. Resection of more than four feet is incompatible with normal digestion, absorption, and nutrition, and often results in death from marasmus. In cases of extensive intestinal resection, the remaining portion of the intestinal tract undergoes compensatory hypertrophy.

It was also found that *physiological exclusion* of an extensive portion of the intestinal tract, does not impair digestion, absorption, and nutrition, as seriously as the removal of a similar portion by resection. Fecal accumulation does not take place in the excluded portion of the intestinal canal, which undergoes atrophy.

Objection was made to the various forms of suture used in *circular enterorrhaphy* for three reasons: first, the time required for their insertion; second, the danger of puncturing the bowel; and third, the interference with nutrition which they cause. The author recommends a modification of Jobert's invagination suture by lining the intussusceptum with a thin flexible rubber ring, and the substitution of catgut for silk sutures is preferable to Czerny-Lembert sutures.

The line of suturing, or neck of intussuscipiens should be covered by a flap, or graft of omentum in all cases of circular resection, as this procedure furnishes an additional protection against perforation. In circular enterorrhaphy continuity of the peritoneal surface should be secured where the mesentery is detached by uniting the peritoneum with a fine catgut suture before the bowel is united, as this modification of the ordinary method furnishes better security against perforation on the mesenteric side.

Intestinal anastomosis. The formation of a fistulous communication between the bowel above and below the seat of obstruction should take the place of resection and circular enterorrhaphy in all cases where it is impossible, or impracticable to remove the cause of obstruction, or where the pathological conditions which have given rise to the obstruction do not constitute an intrinsic source of danger. Gastro-enterostomy and jejuno-ileostomy should always be made by approximation with partially or completely decalcified perforated bone plates.

In making an intestinal anastomosis for obstructions in the cæcum, or colon, the communication above and below the seat of obstruction can be established by apposition with decalcified perforated bone plates, or by lateral implantation of the ileum into the colon or rectum. An ileo-colostomy, or ileo-rectostomy by approximation with decalcified perforated bone plates or lateral implantation, should be done in all cases of irreducible ileo-cacal invaginations, where the local signs do not indicate the existence or occurrence of gangrene and perforation. In all cases of threatened gangrene and perforation, the invaginated portion should be excised, both ends of the bowel closed, and the continuity of the intestinal canal restored by making an ileo-colostomy by approximation with perforated decalcified bone plates, or by lateral implantation. The restoration of the continuity of the intestinal canal by perforated approximation plates or lateral implantation, should be resorted to in all cases where circular enterorrhaphy is impossible, on account of the difference in the size of the lumina of the two ends of the bowel.

In cases of multiple gunshot wounds of the intestines involving the lateral or convex side of the bowel, the formation of intestinal anastomosis by perforated decalcified bone plates should be preferred to suturing, as this procedure is equally, if not more safe, and requires less time.

Adhesion experiments. Definitive healing of an intestinal wound is only completed after the formation of a network of new vessels in the product of tissue proliferation from the approximated serous surfaces. Under favorable circumstances, quite firm adhesions are formed between the peritoneal surfaces within six to twelve hours, which effectually resist the pressure from within outward. Scarification of the peritoneum at the seat of approximation hastens the formation of adhesions and the definitive healing of intestinal wounds. Omental grafts, from one to two inches in width, and sufficiently long to encircle the bowel completely, retain their vitality, become firmly adherent in from twelve to eighteen hours, and are freely supplied with bloodvessels in from twenty-four to forty-eight hours. Omental transplantation, or omental grafting, should be done in every circular resection, or suturing of large intestinal wounds, as this procedure favors the healing of the visceral wound, and furnishes an additional protection against perforation.

Adjourned.

OBSTETRICS.

PROFESSOR DELASKIE MILLER, of Chicago, opened the Section meeting with an

INAUGURAL ADDRESS.

His chief duty, he said, was to extend a cordial greeting. More than sixty thousand physicians now in the practice of obstetrics in the United States, will accept the utterances of these meetings as the decision of the court of last appeal. Upon the subject of craniotomy, he remarked, "Under the new *régime* the interests of the living child will constitute a more important factor, and justly so, for in the ideal future the child shall be preserved by operations which shall not enhance the danger of the mother." With reference to the treatment of intrauterine pregnancy, he said: "The electric current may be directed through the ovum with the confident expectation of arresting its vitality without adding to the danger of the mother." On the puerperal state, he said: "Of first importance to insure success in obstetric practice is the adoption of a *régime* which shall render the puerperal woman aseptic. No argument is deemed necessary to establish this position."

The line of eminent men in our department of medicine is short when compared with that of the Orient, still in America we may present the names of obstetricians of past generations who would reflect credit on any age or part of the world. He then briefly referred to the labors of Bard, Dewees, Meigs, White, of Buffalo, Miller, of

Louisville, Wright, of Ohio, Hodge, James, Shippen, Francis, Channing, Gilman, and Elliott.

The following paper was forwarded by DR. J. BRAXTON HICKS, of London, and was read by proxy,

ON THE CONTRACTIONS OF THE UTERUS THROUGHOUT PREGNANCY, AND THEIR VALUE IN THE DIAGNOSIS OF PREGNANCY, BOTH NORMAL AND COMPLICATED.

Fifteen years ago he directed attention to the fact that during the whole of pregnancy the uterus contracts and relaxes, at intervals, usually varying from five to twenty minutes, and the object of this paper was to point out the practical application of the knowledge obtained by recognizing these intermittent contractions.

Up to the fourth month, it is better to employ external and internal palpation. Suppose that a single woman is brought to the physician, for amenorrhœa, of four or five months' duration, and as increased size is noticed by her friends, an easy opportunity is thus afforded to us to make a superficial examination: and thus, without implying any suspicion, we can ascertain whether there be any swelling in the uterine region, and if there be, whether it is permanently firm or of varying density. Should the latter be the case, then we have sufficient grounds to go further into the case, and proceed to internal examination.

There is a condition of the pregnant uterus, to which the author first called attention, wherein at about the fifth month, the uterus during the intervals is very flaccid, scarcely to be felt, except at one part, where a firm lump is to be felt, more like a tumor on one side; and this condition is very often associated with the death of the fœtus, which increases the deception, although it is true that in this condition of flaccidity the fœtus is more readily felt than when the uterus is firm. The diagnosis here is difficult, between simple pregnancy, pregnancy with tumor, and extrauterine fœtation until we feel the uterus contract, when the whole is resolved into a solid ball till relaxation again occurs. The more solid portion marks the position of the placenta.

In cases of pregnancy associated with fibroma, we are enabled, by watching these contractions of the uterus, to distinguish generally between the portion occupied by the pregnancy and that occupied by the tumor. But in cases in which the tumors are numerous and the pregnancy early, it is not so easy; sometimes it is impossible. The diagnosis between ovarian tumors alone, or in connection with pregnancy, is easy, being based upon the alteration in density of the tumor or tumors.

The diagnosis between extrauterine fœtation and normal pregnancy is more difficult, because our proof in the former case is of a negative character. If it be normal pregnancy suspected to be extrauterine, then the proof is more easy. Supposing we have a combination of the two, then a careful examination will, sooner or later, reveal which of the two is uterus.

In twin pregnancy, where sometimes one ovum is dead and small, or one complicated with hydramnios, we have difficulty in determining the nature of one, whether it be a separate tumor; but when we find, as the uterus contracts, the variable parts brought together into one spheroid, we may conclude that the whole is within the uterus; and palpation and the stethoscope will easily reveal the dual contents.

In case of overdistention of the uterus, as by hydramnios, we lose, to a large extent, these contractions, and there is, therefore, a difficulty in distinguishing between it and a large ovarian cyst, though, of course, we have other helps; and in cases of molar pregnancy of the solid kind, or where the ovum is dead and the uterus has become more resisting in consequence, we find often rigid contraction of its walls, lasting for days together.

Alteration of density, alleged in cases of soft fibromas of the uterus—never observed by the author—only interferes with the diagnosis between these cases and those of molar pregnancy and abortion, in which there is menorrhagia. The menorrhagia—continuous except in cases of extreme anæmia—and the rate of growth serve to differentiate soft uterine new formations from molar pregnancy and abortion.

Persistent contraction of the uterus is rare without some abnormal state of the ovum, by which it is sometimes caused; but it may be expected also to be detrimental to the vitality of the fœtus, interfering with its circulation.

Three cases were cited to illustrate the above propositions. In Case IV., of suspected extrauterine pregnancy, the author was asked to decide whether the fœtus in a woman, seven months advanced in pregnancy, was placed within or without the uterus. The size of the abdomen was in correspondence with that of normal pregnancy, and the existence of a fœtus was also without doubt. The abdomen was examined only externally at first, and was soft, with only the fœtus to be felt; but in a few minutes the fœtus was less and less felt, till the abdomen was occupied by a firm pyriform mass which could easily be decided to be the uterus in contraction. This was quite evident when the contraction passed off, leaving the abdomen as soft as before, and the fœtus easily made out, as at first.

Dr. Hicks concluded with the following *résumé:*

I. During the whole of pregnancy, the uterus contracts at intervals, varying much, but commonly from five to twenty minutes, remaining contracted for a variable time—from three to five minutes.

II. If we place our examining hand on the uterus at the time of contraction, the uterus will be firm, pyriform, and the fœtal parts not easily detected, in general. If we place our hand in a state of repose, or allow it to remain on till the firm condition has passed away, then the outline of the uterus is found indistinct, sometimes not to be felt at all; while the fœtal parts are more or less easily detected, and can often be pressed by the fingers into various positions.

III. By noticing these facts we are enabled with ease, in general, to decide as to the existence of normal pregnancy: to diagnosticate between this and various tumors, both uterine and abnormal pregnancies; between pregnancy and distention of the bladder, and other conditions easily recognized by the practitioner.

IV. These intermittent contractions have the physiological use of emptying the uterine veins and thus changing the highly carbonized blood for that more aërated.

V. From some observations he is inclined to think that there is some closely constant relationship between this highly carbonized blood-accumulation and the fœtal movements, and between the fœtal movements and uterine contraction.

VI. He can confidently commend to the profession this additional help in the diagnosis of pregnancy, one easily recognized and easily learned. In his own practice it has proved to be of the greatest service for many years.

PROFESSOR A. R. SIMPSON, of Edinburgh, expressed the indebtedness of obstetricians to the rhythmic contractions of the pregnant uterus and their value in the diagnosis of pregnancy. He always insisted on the importance of attending to the alternate hardening and softening of the uterus, especially during the early months when, as yet, the fœtus had not become so developed as to be recognizable to touch or auscultation, and in cases in which the ovum had become addled, or was undergoing degeneration. As regards the physiological effects of these contractions, he thought it important to note the results of them at the close of pregnancy and the commencement of labor. There had been discussion between Küneke and others as to whether the uterine sinuses remained distended with blood or not. The probability was, as indicated by Dr. Braxton Hicks, that during contraction the uterus became anæmic. In Braun's frozen sections one could see that the walls of a uterus caught in diastole had had its vessels filled, whilst in the uterus caught in systole, when the walls were contracted and thickened, the vessels were empty. During each contraction the blood expelled from the uterus would first distend the blood-vessels in the cervix uteri and the vaginal walls. As a consequence of the engorgement of the capillaries of these structures, there took place exudation, increased mucous secretion and the softening of the tissues generally which was sometimes called vital dilatation, and the full development of which was so important for enabling the practitioner to form a favorable prognosis in ordinary labor. The sign was of especial diagnostic value at the third month—after Hegar's sign has been elicited—on bimanual palpation.

DR. CHARPENTIER, of Paris, narrated the history of a case of pregnancy complicated by hydramnios, in which Braxton Hicks's sign had been of very great aid.

DR. A. F. A. KING, of Washington, said the only detracting circumstance applying to the method of diagnosis under consideration, is the impossibility of differentiating the intermittent contractions of pregnancy from those produced under manipulation, in case of foreign bodies, such as polypi, retained menses in the caverna uteri, the positive diagnosis of pregnancy during the first three months, being practically impossible.

DR. DUNCAN C. MACCALLUM, of Montreal, then read a paper on

VICARIOUS MENSTRUATION.

He stated that the possibility of hemorrhage taking place from some other part of the body than the uterus as the immediate result of the suppression of the menstrual function, had been admitted from an early period by medical authorities, and accepted as an established fact by the profession generally.

As there appears to exist a discrepancy of opinion regarding what really constitutes vicarious menstruation, he said it was of great importance for the proper understanding of the subject, that agreement should be arrived at on this point. If the term be held to include all cases of hemorrhage occurring at the menstrual epoch, the menses being absent, and no other possible cause for the hemorrhage being present, whether the phenomenon be repeated or not at one or more succeeding menstrual periods, the cases would be very numerous, and there are probably many physicians in active practice who have met with one or more examples.

Suppression of the menses is a condition which frequently engages the attention, and comes under the care of the practical physician, but it is seldom attended by hemorrhage. It would appear, therefore, that something must be superadded to the amenorrhœa—some condition of the vasomotor nerves, or of the vessels of the part from which the blood escapes.

He then gave the details of the four cases of vicarious hemorrhage which had come under his observation—two of hæmatemesis, one of hæmoptysis, and one of epistaxis, and concluded by saying: Each of these cases fulfils the three main conditions demanded to constitute what he conceived to be a case of vicarious menstruation, namely—(a) Absence of a flow of blood from the uterus at the menstrual epoch. (b) An eruption of blood from some other organ. (c) Absence of any cause for the ectopic hemorrhage, other than arrested menstruation. It fulfils in the relief of vascular tension one of the principal objects of the menstrual discharge. It is clearly a vicarious hemorrhage.

DRS. BARTLETT and NELSON narrated histories of cases of alleged vicarious hemorrhage.

PROFESSOR T. LAZAREWITCH, of St. Petersburg, then presented, through the Secretary, a

DESCRIPTION OF A NEW NORMAL FORCEPS.

Inspecting the child's head after each forceps operation, and sketching the impression, he found that when the impressions were made on the cheek bones they were at a distance from the protuberance of the temporal bones, equal to half of the arc of the blade.

The greater the surface on which the blades act, or, the more curved inward the blades are, the greater will be the expelling power. Dr. Lazarewitch's parallel forceps, whatever the size of the head, preserve the same grasping power which in other forceps diminishes in proportion to the size of the head. He has constructed a lock that prevents slipping, by preserving the same inclination of the blades, whatever the size of the head.

The lock is constructed with a tenon entering freely into the large mortise, made in each branch of the forceps, the tenon being fixed by a screw in one branch, which is retained at the desired distance from the other by a projection constructed on each side of the tenon. This lock permits mobility by turning each half of the forceps on the longitudinal and transverse axes.

The conoid form of his *normal* straight forceps enables the operator to extract the head without drawing out the blades, and to place the blades in any one of the diameters, transverse, oblique, or conjugate.

His description of the forceps is as follows:

Made of steel, nickel plated; 13½ inches long; the blades have some elasticity, their surfaces smooth and polished. At a distance of ¾ of an inch from the tips, the blade is 1⅗ inches wide, and from the point grows narrower, until it is about ½ of an inch at the neck. The fenestra—elongated oval—⅞ of an inch wide, and 3¾ inches long. The cephalic curve has a radius of

7¾ inches. The inner surface of the handle is 1 inch in width, and 3¾ inches in length. The tenon of the lock is ¾ of an inch wide, 2¾ inches long, and ⅛ of an inch thick. The mortise is $\frac{9}{16}$ of an inch long and is about ⅓ of an inch wide.

He has employed his straight forceps, with the parallel handles, several times in the low operation, nine times in the high operation, with perfect success; with the latest improvement, in two cases.

He has successfully applied his forceps in one case of breech presentation, without any injurious compression. In such cases the blades must be applied as far as possible upon the bistrochanteric and transverse diameters.

GYNECOLOGY.

The Section met in Masonic Temple at 3 P. M., the PRESIDENT, DR. H. O. MARCY, of Boston, in the Chair.

The proceedings were opened by a few fitting words of welcome on the part of the President, especial allusion being made to the part which Americans, and especially Marion Sims, had played in the development of this branch of medicine.

DR. NATHAN BOZEMAN, of New York, then read a paper upon

THE GRADUAL PREPARATORY TREATMENT OF THE COMPLICATIONS OF URINARY AND FECAL FISTULAS IN WOMEN,

including a special consideration of the treatment of pyelitis by a new method, and the prevention of the evils of incontinence of urine by a new system of drainage. He referred at length to his well-known method of preparatory treatment for operation upon fistulas of various kinds and various degrees of severity, exhibiting and explaining the appliances which he is in the habit of using for producing dilatation and removing adhesive bands. The great difficulty has been hitherto so to control the escape of urine that its annoying and injurious effects could be obviated. He believed that that question was now solved by the use of a combined dilator and urinal, consisting in a hollow metallic receptacle, perforated with a few holes upon its upper surface, and provided with a long rubber tube which projects from the vagina. This instrument may be considered as supplemental to or developed from the hard-rubber vaginal dilators and the soft-sponge bag dilators which he has been using for many years. This method of treatment has been recently extended by him to certain cases in which, in addition to an urethro-vaginal fistula, pyelitis had also developed. Several ingeniously constructed probes and catheters were shown, by means of which he had been able to explore the ureter even to the pelvis of the kidney, to complete a diagnosis of pyelitis, and, by irrigation of the diseased organ, to bring about great improvement in the patient's condition. The operative procedure for accomplishing this end he has termed kolpo-uretero-cystotomy. He summarized his views as follows:

1. That the importance of the complications of fistula in the female has not been sufficiently appreciated.

2. Kolpo-kleisis is an unjustifiable operation, and leads to cystitis, pyelitis, etc.

3. The combination of drainage with dilatation as here expounded is believed to be productive of most useful results.

4. Some form of drainage is suitable for every case in which a vesico-vaginal fistula exists.

5. For such cases drainage will prove a means of great relief.

6. It is believed that this method of operation will prove of great service in the treatment of pyelitis and some other renal diseases.

DR. GRAILY HEWITT, of London, in opening the discussion, made a graceful allusion to the pleasure he had experienced in being in America at this time, and generously gave full credit to American gynecologists for the work which they had done. He considered that Dr. Bozeman's paper marked a distinct advance in the treatment of urinary fistulas; and the suggested operation for pyelitis was directly in the line of conservative surgery, and an improvement upon nephrotomy or nephrectomy.

DR. ADDINELL HEWSON, of Philadelphia, referred to his satisfactory experience in the use of the author's method of dilatation in the preparatory treatment of fistulas. He had also derived great advantage from the injection of a current of carbonic acid gas highly charged with sulphuretted hydrogen (exactly the same treatment that is followed in Bergeon's method of treating pulmonary phthisis *per rectum*) into the vagina and bladder. The treatment was usually continued for twenty minutes at a time, and satisfactory dilatation resulted.

DR. WATHEN, of Louisville, read a paper upon

RAPID DILATATION OF THE CERVIX,

stating at the outset his predilection in favor of this operation by means of steel dilators, especially in the treatment of dysmenorrhœa and sterility. Tents of all kinds were believed to be more or less unsafe, and a two-bladed instrument was preferred to bougies or any other form of instrument for this purpose. The operation should always be done with the greatest regard to antisepsis, and in case he dilatation is to exceed three-quarters of an inch, general anæsthesia to a moderate degree should be first produced. The form of dilator which he used had parallel blades which were thickened at the tips, and enabled one to dilate as thoroughly at the os internum as at the os externum, the blades not giving or springing, and thus producing unequal dilatation, as is too apt to be the case with such instruments as Goodell's for example. He considered that this method of operation could be substituted for other means in almost every case in which dilatation is indicated.

DR. A. MARTIN, of Berlin, in opening the discussion, sketched the development of the idea of dilatation since it was first propounded by Simpson, forty years ago, and alluded to the great changes which had occurred to the operation during that period. He quite approved of the author's idea of making the dilatation ample at the os internum, if it were done at all. For himself, however, he did not see the necessity for doing the operation frequently. The womb could be explored after slight dilatation, perhaps with the finger, and the curette could then be used if the question were one of diagnosis as to the character of the endometrium. He sometimes had occasion to divide the cervix with a knife, after which the interior of the organ could be ex-

plored, and the wound then closed as in the ordinary Emmet operation.

DR. WEEKS, of Portland, Me., thought the operation contraindicated in cases in which there was faulty condition of the ovaries and tubes. It was not an operation which was devoid of danger. He had lost a patient who was seized with acute peritonitis on the fourth day after a second operation for dysmenorrhœa.

DR. REED, of Ohio, deprecated the general advocacy of this method of treatment.

DR. GOELET, of New York, thought the great end to be attained was to produce dilatation to a certain degree, and then retain it by the use of a stem pessary for a sufficient length of time.

DR. TRENHOLME, of Montreal, laid stress upon the statement that those cases were not suitable for operation in which there was either uterine congestion or any disease of the tubes or ovaries. The patient should be examined just after menstruation is ended, and if any of these conditions are found no operation should be done. After the operation he approved of the use of a curved stem.

DR. GLISAN, of Portland, Oregon, had always obtained satisfactory results from the operation, and without especial attention to antisepsis.

DR. REEVES JACKSON, of Chicago, deplored the frequency with which the operation is done. He thought it useless except for purposes of exploration.

DR. NOTT, of Texas, believed that the field for the proper performance of the operation was a limited one.

DR. BURNS, of Allegheny, Pa., preferred to dilate the uterus, in proper cases, with hard rubber stems, leaving them in for several days and securing proper drainage.

DR. BALLS-HEADLEY, of Melbourne, Australia, still found Sims's operation of posterior section satisfactory in cases of stenosis attended with dyspnœa. He could not understand the great enthusiasm in America upon the subject of rapid dilatation.

DR. HOFF, of Ohio, obtained satisfactory dilatation with tents made of the pith of the cornstalk and wrapped with absorbent cotton.

DR. MCBURNEY, of Detroit, found as the result of a great many measurements upon the cadaver, that dilatation was anatomically unnecessary in most cases, and believed that he accomplished the same result, namely, the relief of congestion, by the use of suitable vaginal applications.

DR. DORRANCE, of England, still followed Sims's plan of cutting the cervix from the os internum to the os externum, keeping the wound open by means of a piece of lint laid within it, in those cases which are ordinarily treated by dilatation. During gestation, if it be desired to dilate the cervix, he uses an aseptic sponge tent.

DR. ASDALE, of Pittsburg, had never seen any bad results from the operation. He preferred steel dilators to tents. He had often seen sterility relieved by the operation.

DR. SATTERLEE, of Kentucky, had never had occasion to perform the operation, believing that the same results could be obtained by vaginal applications of hot water.

DR. WATHEN, in concluding, stated that he did not hesitate to perform the operation in his office, in suitable cases. He did not accept Emmet's dictum, that there was no such thing as congestive dysmenorrhœa. If Emmet did not believe in the conditions for which the operation was required, he could not consistently do it, hence his opposition to it. He would do the operation only in cases in which equally good results could not be obtained by milder means.

DR. T. MORE-MADDEN, of Dublin, forwarded a paper entitled

ON THE CAUSES AND TREATMENT OF BARRENNESS,

which was read by the Secretary.

It presented, in tabular form, a statement of the causes of sterility in five hundred and twenty-eight of the cases of infecundity occurring in married women, within the childbearing period of life, that had come under his observation. The cases may be roughly divided into four classes, viz.: 1st. Those in which barrenness was occasioned by sexual impotency or some physical impediment in the passages from the vulvar orifice to the ovaria. 2d. Cases of true sterility, or conceptive incapacity from deficiency congenital or acquired, structural disease, arrested developments, supra-involution, etc., of the uterus or from analogous morbid conditions of its appendages. 3d. Cases of barrenness from constitutional causes. 4th. Cases in which the causes of infecundity were apparently moral rather than physical, such as sexual incongruity, etc.

The most frequent of these causes of sterility is stenosis of the cervical canal. And, as he believes that the operative treatment of such cases, simple as it is deemed by some, requires more consideration than it generally receives, and frequently proves worse than useless from the disregard of certain details and precautions which he considers essential, he ventured to recommend the adoption of a method of procedure and the use of instruments which he had found advantageous in the curative treatment of stenosis in three hundred and eighty cases of obstructive dysmenorrhœa and sterility traceable to this cause.

The essential features of the method of treatment now referred to are the separation by cutting and simultaneous forcible expansion of the affected parts, followed by dilatation during the period of cicatrization, so as to prevent their subsequent contraction, and thus to secure the permanent patency of the previously occluded passage. To obtain this result he employs three instruments, namely: a special form of uterine director, which can, generally speaking, be introduced into any cervical canal, however narrow, and along which a serrated, triangular-guarded knife is made to travel up through the os internum; and, thirdly, a uterine dilator of great power, by which any required degree of cervical expansion may be effectually secured and accurately gauged.

The influence of uterine flexions in the prevention of pregnancy and the treatment he adopts in cases of sterility dependent thereon were described. He then dwelt on the subject of conceptive incapacity from morbid conditions of the Fallopian tubes, as he regards stenosis, as well as occlusion of these ducts by vaginitis and its results, such as hydro- and pyosalpinx, as far more common causes of sterility than is generally recognized. Moreover, he also holds that such tubal diseases may, in many instances, be efficiently dwelt with without resort to the serious operative procedures—*i. e.*, the removal of the uterine appendages, which, by some

surgeons, are considered invariably necessary, and are by them so freely employed in such cases. Therefore, he referred at some length to those less heroic alternative measures, such as aspiration and catheterization of the Fallopian tubes, the feasibility and the successful results of which, in appropriate cases of this kind, he has demonstrated clinically.

DR. GORDON, of Portland, Me., believed that sterility was not often due to stenosis of the canal. Other important causes were vaginismus, a diseased uterine mucous membrane, which was usually due primarily to a displacement of the uterus, and disease of the tubes and ovaries.

DR. REED, of Ohio, thought that Hodge as well as Graily Hewitt, deserved great credit for suggesting the treatment of these disorders by mechanical supports.

DR. GRAILY HEWITT modestly admitted that he but took up Hodge's suggestion and applied it to anterior displacements, as Hodge had to posterior ones. Besides dilatation as a means for relieving sterility and dysmenorrhœa, the uterine canal should also be straightened, and both ends were often accomplished by the same means.

DR. SMITH, of Montreal, suggested that disease of the testicles must not be overlooked in the treatment of sterility.

DR. NELSON, of Chicago, observed that the uterus must not only have no gross lesions, but its mucous membrane must also be susceptible of normal congestion in order to conception. Abuse of coitus was also believed to be a potent cause of sterility.

THERAPEUTICS AND MATERIA MEDICA.

THE PRESIDENT, DR. TRAILL GREEN, of Easton, opened the proceedings of the Section with a short address, dealing largely with the history of the study of this branch of medicine in the United States, and referring in laudation to Morgan and Kuhn, the first teachers of materia medica in America. He also spoke in complimentary terms of the recent works on therapeutics by American authors, more particularly those of Drs. George B. Wood, Stillé, Robley Dunglison, and H. C. Wood, and referred to the two dispensatories, printed in this country, as triumphs of medical authorship. He impressed upon his hearers the fact that the rational use of drugs rests upon a knowledge of their physiological action, and that for this reason experiments on the lower animals are necessary and of great value.

DR. C. D. F. PHILLIPS, of London, in reply, thanked Dr. Green for his kindness to all the members of the Section, and stated that Englishmen all owed much to the works of Stillé and the elder and younger Wood, each new edition of whose books was always welcomed in England.

The Section, after transaction of other business, adjourned to meet on Tuesday afternoon at 3 o'clock.

DISEASES OF CHILDREN.

The Section was called to order by THE PRESIDENT, DR. J. LEWIS SMITH.

DR. SAINT GERMAIN, of Paris, forwarded a paper on

PREPUTIAL DILATATION AND IGNIPUNCTURE IN PLACE OF CIRCUMCISION AND TONSILLOTOMY,

which was read by the Secretary, and presented the following conclusions:

In view of the frequency of these two classes of cases, and of the satisfactory results obtained without risk to the patients, ought we not to consider the substitution of preputial dilatation and ignipuncture of the tonsils in the place of circumcision and tonsillotomy an appreciable surgical advance?

DR. A. MARCH, of Illinois, thought simple incision the more satisfactory and radical measure, and that there is but little danger from incision. We have trouble only about once in three hundred times.

DR. LEWIS A. SAYRE, of New York, read a paper on the

DELETERIOUS RESULTS IN CHILDREN OF A NARROW PREPUCE AND PREPUTIAL ADHESIONS.

He partially reviewed the literature of the subject to establish his claim to having been the first to call attention to the significance of these cases. He recommended as little cutting as possible, just enough to permit of preputial retraction. He inserts a grooved director under the prepuce, and then cuts all contracted tissues, and no more, with a curved bistoury. If necessary, a slight cut may be made with scissors. He strongly objects to the general and unjustifiable mutilation of the prepuce. Enough should always be left to form an adequate covering for the glans. It is very common to mutilate the prepuce of small children for symptoms that do not justify operative interference. He reported a number of cases of reflex disturbance from constriction or adhesion of the prepuce, or the collection of smegma, showing the prompt relief afforded by circumcision and the removal of smegma.

DR. DE FORREST WILLARD, of Philadelphia, was glad Dr. Sayre had modified his former radical ideas as to the value of circumcision. He did not doubt that reflex symptoms result from preputial contraction, and he had seen many such cases. It is often that children have a slight agglutination of the prepuce and glans, and they require nothing but a stripping back of the prepuce and cleansing of the glans, which will, in many cases, take the place of all operative interference. Long prepuces are often mistaken for contracted ones, and a little care in stripping back will fully expose the glans. Care must be taken to avoid paraphimosis. In case of swollen glans it is well to make suitable intrapreputial injections for several days. In older children and adults there is less to be hoped for from dilatation, and circumcision is more often called for. He thinks the prepuce is only intended to cover and protect the glans during infancy and childhood.

DR. SAYRE thought the daily stretching and stripping back of the prepuce cruel and inhuman. Slight nicking is a simpler and better plan.

DR. LEWIS H. SAYRE preferred always to operate in all cases having symptoms pointing to organic disease of the cord, thereby giving otherwise hopeless cases the benefit of every doubt. He cited the almost complete cure in this way of a case circumcised by him after having been diagnosticated by the leading neurologists of the country as a case of pseudo-hypertrophic paralysis.

DR. BOOKER, of Baltimore, objected to Dr. Willard's "stripping plan," on the ground that it would lead to masturbation.

DR. WILLARD thought masturbation would not be

induced if the prepuce is not tight, as one that slides back freely and easily causes no erethism.

DR. I. N. LOVE, of St. Louis, suggested that the majority of cases of preputial irritation called for the carrying out of the Mosaic law.

DR. GORDON, of Portland, Me., also favored the rabbinical procedure, so as to insure the daily stripping and washing, as mothers are not to be depended on to do this.

DR. P. R. FURBECK, of Gloversville, N. Y., related cases showing prompt and permanent relief from one complete dilatation. He did not favor repeated dilatation.

DR. J. LEWIS SMITH called attention to the causative relation between preputial and urethral stenosis, and collections of smegma, to inguinal hernia in children. Cases of hernia in children have been relieved by circumcision. The hernia is caused in these cases by straining efforts at micturition.

OPHTHALMOLOGY.

MONDAY, SEPTEMBER 5TH.

THE PRESIDENT, DR. J. J. CHISOLM, of Baltimore, in the chair.

DR. A. MOOREN, of Düsseldorf, Germany, read a paper on

EYE TROUBLES IN THEIR RELATION TO OCCIPITAL DISEASE.

He began by recalling to the minds of his hearers that the physiology of to-day places the centre of vision in the cortex of the occipital lobe, and that this localization was first pointed out by Huguenin, who by a section showed a defect in the cortex of these lobes in a case of optic atrophy with amaurosis of the left eye, existing from earliest childhood. He further referred to the experiments of Munck on this same subject as classical, and stated that this observer's conclusions were far-reaching and exact. Willhand formulates the results of his investigations thus, that the color centre is placed on the most exterior part of the occipital lobes, that beneath it we have the centre for acuteness of vision—the centre for the sense of space.

In the third layer there exists, next to Gratiot's visual radiations, the light centre—that is to say, the centre for the visual field. Destruction of the last layer, of course, destroys the functions of the other two, but it is equally evident that destruction of the others does not destroy the centre for the visual field. After describing the conditions of the optic nerve, as seen during the presence of lesions in these regions, he went on to state that though there are "neuropathic individuals who pretend to see from time to time under the symptoms of a scotoma scintillans by serious attacks of hemicrania, the objects half cut," that he had failed in every instance to discover "objectively in such patients any anomaly of this sort." Seguin and Cuschmann place the centre of optic perception in the cortex cuneatus and the first occipital convolution.

DR. CHISOLM, of Baltimore, exhibited a patient suffering from a tumor of the occipital lobes, which had entirely eroded the skull, so that the brain could be felt through the scalp. This growth was first noticed two years prior to the present date, about which time hearing was dulled in the left ear, while the sight of the right eye became impaired. At this time, however, he could still read clearly with the left eye. Five months since both of the nerves showed incipient atrophy, but nevertheless vision was good in the left eye. In the last two or three months both eyes have failed.

DR. LEARTUS CONNOR, of Detroit, then read a paper

ON THE USE OF HOT WATER IN THE TREATMENT OF EYE DISEASES.

He recommended the use of water as hot as could be borne, and stated that the temperature of hot water applications to the eye should never be less than 105° F. or more than 140° F. Temperature below 105° F. was absolutely injurious. The advantages of this treatment consisted in its cheapness, safety, and the fact that it can always be obtained. He believes that poultices should never be used to the eye, for many reasons, and that the hot compress is not so good as the plain hot water application. He recommends also the immersion of the eye in hot water by the inversion of a small tumbler which will fit in such a manner as to prevent leakage over the face.

In the discussion, DR. THOMPSON, of Indianapolis, deprecated Dr. Connor's rejection of the "time-honored poultice," and praised very highly the use of slippery elm, sassafras, and chamomile poultices in many instances of inflammation. He also asserted that, in his experience, every case did not do so well with hot water as might be hoped from Dr. Connor's paper, and that in these instances cold water was of service. He thought the matter depended largely on idiosyncrasy.

The Section then adjourned.

TUESDAY SEPTEMBER 6TH.

GENERAL SESSION.

The second General Session of the Congress was called to order by THE PRESIDENT, DR. N. S. DAVIS, promptly at 10 o'clock.

DR. AUSTIN FLINT, of New York, delivered an address on

FEVER, ITS CAUSES, MECHANISM, AND RATIONAL TREATMENT.

(See p. 287.)

The address was listened to with general and unabated attention. At its close the President announced that it had been decided to postpone the address of Professor Semmola until Wednesday morning, in order to shorten the morning sessions and to avoid interfering with the work of the Sections, which were announced to convene at 11 A. M.

SECTIONS.

MEDICINE.

Owing to a scarcity of papers, the Section held no morning session, but assembled promptly at 3 P. M.

DR. JOSEPH KAPOSI, of Buda-Pesth, Hungary, read a paper on

THE PREVENTIVE POWER OF VACCINATION.

Is it true, he asked, that a less number of vaccinated individuals get smallpox than of unvaccinated? This is

difficult to answer, for to do so it would be necessary to separate the vaccinated from the unvaccinated in smallpox epidemics; and this is not possible. It is claimed, on the one hand, that the vaccinators cannot establish the truth of their claimed immunity. The anti-vaccinationists must rely upon small numbers of cases; and, for the most part, their observations have been among badly vaccinated individuals. This is, of course, no direct answer to the question. It is asserted that the unvaccinated suffer in larger numbers from smallpox than the vaccinated; but this is answered by the anti-vaccinationists by the statement that if this is the case, t is so because the unvaccinated are found among the poor, who are more exposed to all diseases, and who are more likely to succumb to diseases than the higher classes who are less exposed.

Further, it has been established that some diseases can be communicated by vaccination. The anti-vaccinationists therefore say that we conclude that vaccination is not only a useless procedure, but that it is positively dangerous. Such was the statement of the arguments against vaccination.

In the first place, are unvaccinated persons more subject to disease than are the vaccinated? If so, is this fact due to their lack of vaccination? This question could be readily answered if we knew the lethality of all diseases among the vaccinated and the unvaccinated, and if we could compare these statistics with the mortality of smallpox patients. Conclusions would, in other words, be possible, if we know in the case of each patient whether he had previously been vaccinated or not.

He had introduced this method of investigation into each of the nineteen hospitals of his district, and had met with considerable success, during the nine months in which it has been in operation, owing to the efficient coöperation of the gentlemen in charge of these institutions. The reports showed that of about 20,000 patients admitted in that time to these hospitals, 16,135 were vaccinated. Of these there died, from every cause, 1306. There were 2437 unvaccinated patients, of whom 321 died; showing, in the first instance, a mortality of about 8 per cent., in the latter 13 per cent. The mortality from all diseases is thus greater among unvaccinated than among vaccinated. But how is it in smallpox? The statistics of these hospitals showed that amongst the vaccinated patients the mortality of smallpox was 6.66 per cent.; while in the unvaccinated it was 49.68 per cent., or nearly half. It would not now be correct to assume that the relation of immunity conveyed was, therefore, so great as 800 per cent. Two factors must be considered as producing this result; in the first place, the vaccination; and, in the second, the difference of constitution on the part of the individual. As nearly as could be determined, difference of constitution was responsible for 50 or 60 per cent. of this difference, the rest being fairly attributable to the lack of vaccination. It is safe, therefore, to say that the unvaccinated are exposed to about five and a half times greater danger of death from smallpox than are the vaccinated.

The same series of observations show that among 19,738 non-smallpox patients, 2437 had previously been vaccinated, or 12.7 per cent. There were in that period in the hospitals 1113 cases of smallpox. Of these 1113 cases, in order to make the ratio the same as among non-smallpox cases, there should be 141 unvaccinated; but instead of this number, there were 465, or nearly 45 per cent.

Statisticians, in observing the mortality of vaccinated and unvaccinated cases, have confined their observations almost entirely to smallpox patients; but of what value is it simply to say that so many were vaccinated, while a certain other number were not vaccinated? In Buda-Pesth, a city of 20,000 inhabitants, the coroners have been required to report to the essayist whether or not each of the cases coming under their observation had or had not been vaccinated.

The results were even more striking than in the previous observations. The same proportions are found to exist in all periods of life.

In regard to the dangers of vaccination it is impossible to give a perfectly satisfactory answer, owing to the impossibility of determining in most cases whether or not diseases coming on after vaccination are in any way related to the vaccination. Reports were made to the essayist from the same sources in regard to the frequency of syphilis in vaccinated subjects; and, on the other hand, of the proportion of vaccinated and unvaccinated among syphilitics; and, in like manner, of tuberculosis and cutaneous diseases. Only in the instances of cutaneous diseases and syphilis were the statistics sufficiently complete to admit of deductions. The danger of inoculation of these diseases was 13 per cent. If this be correct, he concluded that, as the danger of smallpox was lessened several hundred per cent. by vaccination, whereas this operation exposes to a danger of but 13 per cent., the immunity which it conveys is at the worst cheaply purchased.

DR. C. A. LEALE, of New York, stated that he could verify most of the statements made. His opportunities for investigation in this field had been extremely large, and all the testimony went to prove the protective power of vaccination. That diseases could be communicated by vaccination, there could be no doubt, but the frequency of such inoculation is very small. During more than a year not one case of smallpox has occurred in New York, a fact due, he thought, to the systematic methods of vaccination in practice there.

DR. W. M. WITMARSH, of England, proposed a number of questions eliciting the facts that both bovine and humanized virus are used in Hungary; that but one child, so far as he was aware, had died directly as a result of vaccination, although it is difficult to state the relation of many other cases to the operation.

DR. LYNCH, of Baltimore, thought that no one could examine the statistics without arriving at the conclusion that vaccination does protect from smallpox, if, indeed, it did not also convey some degree of immunity from other diseases. He referred to the prevalence of smallpox in Washington in 1863, when the disease was confined, as is shown by accurate statistics, almost exclusively to the unvaccinated.

DR. KAPOSI stated that he had papers to prove that the late Dr. Keller, of Vienna, whose work had proved probably the most formidable weapon of the anti-vaccinationists, had deliberately distorted facts in order to favor that sect, and asked that a committee be appointed to examine these papers and report at a subsequent session.

DR. W. M. WHITMARSH, of England, read a paper entitled

VACCINATION AND PASTEUR'S TREATMENT.

The treatise consisted of two distinct parts, the former considering vaccination as a preventive of smallpox, the latter the treatment of rabies by Pasteur.

The essayist did not feel justified in affirming that vaccination does bestow an immunity from smallpox, although he would admit that while pock-marked faces were common in London forty years ago, they are infrequent at the present time. Many other diseases have become relatively as much reduced in their frequency as has smallpox, without however, the aid of any such process as vaccination, as is the case with typhus fever, and the plague. This should make us cautious in our conclusions. He closed this part of his address with the petition that all who heard him would use calf and not humanized lymph, as there could be no doubt that the danger from the conveyance of disease by it is much less.

Pasteur's treatment he reviewed at considerable length. He called attention to the apparent errors in the processes, as well as in the selection of cases, and the conclusions arrived at by Pasteur in regard to the curative value of his treatment. That rabies is due to the microbe to which it is assigned by Pasteur is by no means established. The same microbe has been found in the saliva of healthy individuals, and it has been shown by one investigator that a fatal disease can be produced in rabbits by the inoculation of this parasite after the manner of Pasteur. Further, control experiments have not been undertaken by Pasteur. In this connection the essayist proposed the adoption of the test to which vaccination was put in England forty years ago, namely that criminals should be given the choice of meeting their lawful punishment or of undergoing the inoculation according to the method of Pasteur, then, after three months to have a small wound made in their integument and into it place a small amount of virus from a rabid dog. Investigations of this character would soon demonstrate whether or not the inoculations convey an immunity. Cases are unquestionable in which the animal which has bitten the individual afterward resorting to the Pasteur treatment has not been rabid, as supposed. The essayist narrated at some length several such cases which were well authenticated.

He had been strongly impressed by the fact that dogs are permitted to make their abode in the laboratory of Pasteur and eat as freely as they desire of the rabbits, even of the rabid (?) medulla used in the inoculations, and yet he was assured by an assistant that their doing so was entirely devoid of danger.

Finally, he asserted, it has been established beyond doubt that in several cases death has followed the inoculations of Pasteur in which the symptoms displayed not the features of hydrophobia, but of a disease indentical in character with that witnessed in the rabbits which are made to succumb to the inoculations. It is not improbable, therefore, that as a result of these inoculations there has been produced a disease which from analogy should be called Pasteurophobia, in its results far from dangerous. He asked that before risking human beings to the dangers of these inoculations, further demonstrations of their safety and value should be awaited. Bad as it is to be bitten by a mad dog, it is far worse to have injected into one's abdomen ten times as much mad rabbit when, in all probability, the patient has not been bitten by a rabid dog.

DR. C. A. LEALE, of New York, thought that in most of the cases supposed to have been bitten by rabid dogs the animal was not in reality mad, and that the successful results of Pasteur's treatment were largely due to this. The effect of such alarms upon the nervous systems of the delicate can be readily imagined. In conclusion he hoped that in the light of our present knowledge the profession will not resort to Pasteur's method.

DR. WELCH, of Philadelphia, expressed his belief in the preventive power of vaccination and his preference for humanized virus. The danger of inoculation of other diseases with the vaccine virus he did not consider a sufficient argument against vaccination.

Adjourned.

GENERAL SURGERY.

DR. JOHN HOMANS, of Boston, reported

THREE HUNDRED AND EIGHTY-FOUR LAPAROTOMIES FOR VARIOUS DISEASES.

His general method of operating is as follows: The sponges are prepared by soaking in 1–1000 corrosive sublimate solution; they are then wrung out dry by an ordinary wringing machine; they are then kept in a 1–20 carbolic solution. The carbolic acid spray is always used, although it is considered unnecessary. An electric light is always kept in readiness.

Of the first five unantiseptic operations all the patients died. Of the antiseptic operations, 248 recovered and 34 have died. The vitality or viability of the patient has much to do with the result of the operation. The usual causes of death have been peritonitis or septicæmia. He was sceptical about the occurrence of mechanical intestinal obstruction, except as the intestines are paralyzed by peritonitis. Two cases in which the bladder was wounded during ovariotomy, recovered, and are living two and six years respectively after operation. In both cases the opening in the bladder was closed with silk sutures. Of the recoveries, nine patients died of abdominal cancer, a few months or years after recovery, and thirty have ventral hernia. There were fifteen children born to eleven women out of about two hundred heard from. The sexes do not correspond to the ovary remaining.

The usual length of his incision is about two inches. The stump is always tied, burned, and dropped back. Silk sutures are used, and care is taken to include all the abdominal parietes, particularly the transversalis fascia. Drainage was used in fifteen cases. The greatest number of consecutive recoveries after ovariotomy has been thirty-eight. The author had seen a suppurating ovarian cyst but once, and in that case the cyst had been tapped. There are cysts which contain fat and sebaceous matter. which to the naked eye looks exactly like laudable pus, and can only be distinguished from it by microscopical examination. There were two cases of swelling of the parotid gland after ovariotomy. Both recovered quickly, and he did not regard enlarge-

ment of the parotid during convalescence as of special importance.

DR. J. M. MATHEWS, of Louisville, Ky., in a paper entitled

WHEN IS COLOTOMY JUSTIFIABLE?

presented the following conclusions:

1. Colotomy is not justifiable in cases of cancer of the rectum. 2. In stricture or obstruction of the rectum, from whatever cause, within three and a half inches of the sphincter, colotomy should not be done. 3. The operation is not warranted in cases of ulceration of the rectum, unless of specific origin and accompanied with stricture beyond the reach of the finger. 4. Colotomy should not be performed for the presence of a tumor or aneurism causing pressure on the bowel. 5. In cases of congenital occlusion of the rectum, the operation is not to be recommended. 6. In cases where the operation is looked upon as a *dernier ressort*, colotomy should not be done, save for total obstruction, of benign or specific origin, located further than three and a half inches above the sphincter. 7. Where the rectum or sigmoid flexure is closed by a stricture of benign or specific origin, colotomy is indicated.

The reasons for advising against colotomy in the cases given above were: first, that the operation does not prolong life; second, admitting that life could be prolonged, the operation is not advisable; third, instead of prolonging life, surgical interference shortens life; and fourth, the pain is not materially lessened by the operation. Where the disease is located within three and a half inches of the sphincter, it may be treated by division. In other cases rectotomy is recommended.

DR. W. W. DAWSON, of Cincinnati, thought that there are cases in which colotomy seems to be indicated. He had now a patient of seventeen with an immense cancerous mass in the rectum, almost beyond the reach of the finger, and narrowing the calibre of the bowel to half an inch. There is, however, not the slightest sign of cachexia; the growth is accompanied by extreme pain. He had almost decided to open the abdomen, and, if possible, remove the mass with a portion of the gut. This operation has been done in Europe, but it is not old enough to enable us to judge of the results to be obtained. In syphilitic cases, where there is stricture, the stricture disappears under antisyphilitic treatment.

DR. SAMUEL BENTON, of London, understood the author to say that colotomy is not to be recommended for total obstruction due to cancer of the rectum. In his practice, if he can get beyond the cancer, he extirpates. If the growth is so high that he cannot remove the whole of it, he performs colotomy. He would recommend colotomy in these cases of cancer of the rectum. In the cases that he has seen life has been prolonged about fifteen months after colotomy. The last case lived eighteen months. There was complete obstruction, and if the operation had not been performed the patient would have died in two weeks. It is his experience that the straining and bearing-down at stool is relieved by colotomy. The growth, to a certain extent, remains at a stand-still, and a considerable amount of the pain is relieved. After rectotomy the stricture quickly returns. He treats benign tumors by electrolysis. This quickly relieves the stricture. This treatment is safe, and can be continued while the patient remains at his ordinary work. The stricture may return, but it can be kept down by a repetition of the electrolysis, or by dilatation practised by the patient.

DR. J. W. C. O'NEIL, of Gettysburg, thought that the proper course to be pursued in the case referred to by Dr. Dawson would be to put the patient under chloroform, inject the mass with carbolic acid and scrape it out. This will afford relief.

DR. J. W. HAMILTON, of Columbus, uttered a sound of warning against carbolic acid in the treatment of diseases of the rectum. The use of this agent is fraught with danger. Where there is obstruction due to cancer of the rectum colotomy should be performed.

DR. E. M. MOORE, of Rochester, said that it is extremely rare to have cancer at the age of seventeen, but sarcoma is very common. This is not accompanied by the cancerous cachexia, and every surgical operation for sarcoma is a failure. He would recommend colotomy.

DR. W. H. HINGSTON, of Montreal, said that the operation of colotomy should be performed where there is obstruction. It also relieves pain. When the whole of the mass can be gotten away, rectotomy should be performed.

DR. J. W. C. O'NEIL, of Gettysburg, had used carbolic acid for ten or fifteen years and as a general rule had found it of value.

DR. MATHEWS believed that carbolic acid was a hazardous remedy and has led to hundreds of deaths.

DR. DONALD MACLEAN, of Detroit, reported

THREE CASES OF LAPARO-NEPHROTOMY.

CASE I.—Mrs. A., aged twenty-five years, presented herself with what had been diagnosticated as an ovarian tumor. There was a cystic abdominal tumor about the size of the uterus at the seventh or eighth month of pregnancy. There was no history of renal trouble and no evidence that the tumor was connected with the kidney. The patient insisted that it had begun to grow from below. The operation was done with the expectation of removing an ovarian tumor. The left ovary was found enlarged to the size of a goose-egg and was removed. The large tumor was found to arise from the kidney, and it was removed. The patient did well for a time, but suppuration, with the formation of a fecal fistula, occurred, The patient finally made a perfect recovery.

CASE II.—Mrs. T., aged forty years, presented herself with a tumor of the left side of the abdomen which had been discovered six years previously. The enlargement had gradually increased. The tumor when first seen was too high for the ovary and too low for the spleen. The urine was normal. A diagnosis of tumor of the left kidney was made. It was decided to adopt the transperitoneal method of operating. A large cyst of the kidney was found. During removal it ruptured with the escape of a material like soft soap. The posterior layer of the peritoneum was brought together with sutures. The case did well until the eleventh day, when the temperature went up until it reached 104°. Examination showed fluctuation in the lumbar region. An opening was made with the escape of a large quantity of pus. Symptoms of collapse followed this operation, but these were overcome and the patient made a gradual recovery.

CASE III.—A female infant, twenty-two months old.

The family history was good. There was a tumor in the right hypochondriac region. This was movable and free from tenderness and pain. Tumor of kidney was diagnosticated and removal recommended. The incision was made just external to the rectus muscle. No difficulty was experienced and the operation was completed in seven minutes. The posterior layer of the peritoneum was closed with catgut sutures. For several days the case progressed favorably, but the temperature remained high. On the fifth day a careful examination was made to determine the cause of the elevated temperature. During the examination the child coughed and the abdominal incision gave way, allowing the intestines to escape. These were replaced and a search failed to show the source of the trouble. The wound was reunited. The temperature continued high and the child died on the ninth day. At the autopsy the posterior layer of the peritoneum was found united and in the space occupied by the tumor a small collection of pus was found surrounding the ligature on the pedicle of the tumor.

Dr. Maclean said that while the lumbar operation might be the safer there were cases in which the transperitoneal operation was preferable. These cases point to the necessity of efficient drainage although antiseptic precautions are adopted.

MILITARY SURGERY.

DR. JOHN ANDERSON, of London, read a paper on

HEATSTROKE IN INDIA.

DR. MARSTON, of London, in the discussion which followed, dwelt on the difference between heat-exhaustion, sunstroke, and heat-apoplexy. He related some of his experience in India and Egypt, and called especial attention to the sequelæ of these affections, among which he enumerated abnormal and erratic temperaments, insomnia, loss of "nerve," neuralgic headaches, neuralgias generally, and occasionally, though rarely, short attacks of mania. Sometimes the nerves of special sense are affected. Although motor paralyses do occur, they are rare compared with the other forms of nerve lesion. He dwelt on the importance of using a neutral and soluble form of quinine for hypodermatic injection, as tetanus is very liable to occur after slight punctured wounds in hot climates.

DR. LLOYD, of England, considered the prophylaxis and urged the importance of temperate living, good ventilation, and a strict observance of the laws of hygiene generally. Heatstroke, he said, is not ordinarily frequent in the British Navy; ninety per cent. of the cases occur in the Red Sea, and are mainly limited to a class comprised of bakers, cooks, saloon stewards, and stokers. The mode of living is likely the predisposing cause.

DR. SHERWOOD spoke of some of the sequelæ of sunstroke that came to the notice of the Pension Bureau of Washington. He said that cardiac debility and various neuroses, as epilepsy, neuralgia, headaches, etc., are common, and are causes which constitute disability.

DR. ELI A. WOOD, of Pittsburg, said that the exalted temperature of thermic fever is the only pathological condition worth considering in the treatment of heatstroke, and that the sequelæ would surely follow if the abnormal temperature was not reduced within a very short time to near the normal. He held that if the temperature was reduced, all the other symptoms would speedily disappear. Those cases occurring in this latitude are also much benefited if, in addition to the external application of cold, they be given a single hypodermatic injection of 15 grains of antifebrin.

DR. MAX J. STERN, of Philadelphia, remarked that some cases of thermic fever with marked pyrexia were speedily and permanently benefited by bloodletting.

DR. ANDERSON concluded by saying that in no sense did he wish to imply that reduction of temperature is the only one thing to be done in the treatment of these cases, and that external cold and antipyretics are the approved agents for that purpose. In the few cases he could speak of in which bloodletting had been employed death was the inevitable result.

DR. ROBERT REYBURN, of Washington, read a paper entitled

ARE WOUNDS FROM EXPLOSIVE BALLS OF SUCH A CHARACTER AS TO JUSTIFY INTERNATIONAL LAWS AGAINST THEIR USE?

The chief endeavor in the battles of ancient times was to kill as many of the enemy as possible in a given time. The same end is attained in modern battles, but it has been found that an enemy wounded sufficiently to become *hors du combat* is practically much more a source of weakness to his comrades than if he were slain in battle. It is probably too low an estimate to state that every wounded man needs the services of two able-bodied men for his care and sustenance until he becomes again fit for military duty. If, then, the object of modern war is not the taking of life, but rather the disabling and rendering unfit for active service of the enemy's soldiers, why should the inevitable horrors of war be further aggravated? The use of explosive balls does not accomplish any more effectually the disabling of the combatants, but converts slight wounds into grave and fatal injuries of vital organs. The characteristics of wounds caused by explosive balls or bullets are great shattering of the bones at point of injury, with comminution of the fragments, the soft tissues are extensively lacerated, with great destruction of the parts; this is followed by extensive sloughing. In many cases the reparative powers of nature are insufficient to fill up such extensive loss of tissues. The injuries are often accompanied by the dangers of both primary and secondary hemorrhage, and are also followed by the frequent occurrence of erysipelas and pyæmia. For these reasons, and for the sake of common humanity, we believe that the use of explosive balls or bullets in war should be forever prohibited by international law.

DR. CHARLES HOBART VOORHESS followed, with a paper entitled

ARE WOUNDS FROM EXPLOSIVE BALLS SUCH AS JUSTIFY INTERNATIONAL LAWS AGAINST THEIR USE IN WARFARE?

The object of wounding in warfare, he said, is to disable. It is most humane and effective simply to wound and not permanently disable. To kill a soldier disables only one man, but simply to wound one man takes away three, because two are required to carry him to the rear. He suggested the calling of an International

Medical Congress to protest against the present methods of destructive warfare, and offered the following resolution:

"*Resolved*, That, in accordance with the sense of this Section, the Secretary be instructed to present this opinion to the Ninth International Medical Congress, and ask that the Congress direct that the expression of their opinion on the subject of international laws against the use of explosive bullets in warfare, be forwarded to the President and Secretary of State of the United States, and to each representative of the Foreign Legation at Washington, with a request that each shall transmit the same to his respective Government."

DR. JEFFREY A. MARSTON, of England, did not know of the use of explosive balls in warfare, though they are used by sportsmen in tiger shooting, and in hunting other large game. Balls exploding in the air, such as shells and Shrapnel shot, were necessary to render as many members of an advancing column as possible *hors de combat*, and he did not see the necessity for the resolution.

THE PRESIDENT, DR. HENRY H. SMITH, explained that the object of the motion was to give the United States an opportunity to place herself in the rank of the humane nations.

The resolution was then carried *nem. con.*

DR. JEFFREY A. MARSTON, of the British Army, then read a paper on

AGE AND ACCLIMATIZATION OF SOLDIERS IN REFERENCE TO SERVICE.

He held that men make the best soldiers between the ages of twenty-five and thirty-five years; that while young men are better able to make great sudden exertions or undergo such strain, older men have greater powers of endurance. Short-term men suffer more with sickness than those who have been long in service. This is especially true of enteric fever, and the statistical returns to the English Office are so monotonous in their uniformity in this regard that it may almost be considered a general law that length of service lessens the liability to enteric fever. The time for gaining comparative immunity from this affection is about two years, and continued service gives almost absolute immunity.

DR. MORSE K. TAYLOR, U. S. Army, said that the heart is the first organ to fail after the first two years. In this respect his observations of our soldiers agree with the author's investigations of English soldiers.

OBSTETRICS.

DR. JAMES C. CAMERON, of Montreal, opened the session with a paper on

THE INFLUENCE OF LEUKÆMIA UPON PREGNANCY AND LABOR.

Our knowledge of leukæmia is fragmentary and incomplete, especially in regard to its influence upon the sexual and reproductive functions of women, and the broader question of heredity. We find it stated that sometimes menstrual and sexual disturbances are among its early prodromata—that it is most frequent at the climacteric—that in a few cases it has developed during pregnancy, or after several miscarriages or difficult labors, or after the sudden suppression of the menses from cold; that in the non-pregnant, amenorrhœa is the rule, though menorrhagia has been observed, and that uterine hemorrhage is rare. By a careful search through the literature of the subject, he had found reports of four cases in which leukæmia was alleged to have occurred during the course of pregnancy, but none where a woman already leukæmic has been known to have become pregnant. One case reported by Dr. Ingle to the Cambridge Medical Society in 1881, was rather a case of exaggerated leucocytosis of pregnancy than one of true leukæmia. Three other cases were reported to the Edinburgh Medico-Chirurgical Society in 1870, by Dr. Robert Paterson, but as a blood count was not made, and no autopsy held in the two fatal cases, their value is seriously impaired.

The case he reported is unique, as far as he had been able to ascertain, and possesses some points of unusual interest.

1. *Family history.* Grandmother, mother, and probably brother, have suffered from symptoms pointing to leukæmia. Two of her own children have had well-marked leukæmia, another is now in ill health with diminished red corpuscles and enlarged spleen. None of her childen reach the standard of 5,000,000 red corpuscles per c.mm. Has leukæmia in this case been hereditary?

2. *Splenic tumor* was first noticed by the patient at the *beginning* of her sixth pregnancy.

3. *Spleen and liver* always enlarge during pregnancy and become tender.

4. Progressive enormous increase of white corpuscles, together with decrease of red corpuscles as pregnancy goes on.

5. *Absence of uterine hemorrhage* during labor and the puerperal period; labor was dry and bloodless, and lochia untinged with red.

6. Rapid subsidence of œdema and dyspnœa after the termination of labor, together with the rapid increase of red, and decrease of white cells.

7. Thoroughness of recovery, so as to be able to work; and the remarkably chronic course of the disease.

8. Recurrence of pregnancy—now the third time since splenic enlargement was noticed.

9. Remarkable difference between blood of mother and child, and between the blood in sinuses, vein and artery in the placenta.

10. Disastrous effect of nursing upon the child—causing purpura, vomiting, purging, and death.

DR. C. W. EARLE, of Chicago, referred to the operation of cirrhosis of the pancreas, as an etiological factor in the leukæmia of pregnancy.

MM. CHARPENTIER and BUTTE presented a paper on

EXPERIMENTAL URÆMIA; ITS INFLUENCE ON THE VITALITY OF THE FŒTUS.

They described a series of experiments upon pregnant rabbits to which urea was given in (1) doses large enough to prove rapidly fatal; (2) in daily doses of thirty grains or one drachm for a period of eight or ten days. The conclusions reached from these experiments were, that the fœtus was killed with the mother. The cause of the death of the fœtus was not the sudden diminution of blood pressure in the maternal circulation, as held by Runge, nor the diminution in the oxygen of the maternal blood, but a direct fatal intoxication of the fœtus by maternal blood surcharged with

urea. The views suggested by the experiments, the authors claim, are confirmed by their clinical observation.

PROF. LUSK, of New York, remarked that formerly he was of the opinion that the fœtus died of asphyxia —accumulation of carbonic acid in the blood—but owing to the researches of Charpentier and others, it was necessary to add the factor of direct poisoning by urea, and other retained excrementitious urinary products.

DR. DUNCAN C. MCCALLUM, of Montreal, thought Charpentier's paper an argument for the induction of premature labor in the interest of the child, as well as of the mother, in cases of morbus Brightii during pregnancy.

DR. SÄNGER, of Leipsic, then opened a discussion

ON THE CÆSAREAN SECTION.

The good results obtained by the Porro operation, he said, put for awhile Cæsarean section in the background. With the use of antiseptic precautions, and with some improvement in the performance of the operation, such good results have been obtained by the Cæsarean section, that this operation is now preferable to Porro's in the following cases: 1st. When the child is living, and cannot be delivered alive by any other operation, as by application of forceps, turning, or the induction of premature labor. 2d. When the child is dead, and cannot be delivered by craniotomy or embryotomy, or only be delivered with the greatest danger to the mother. But good results can be obtained by Cæsarean section only under certain conditions, and when the operation is performed according to new and approved technical principles.

The conditions required for a successful performance of Cæsarean section are, (*a*) absence of septic infection in the uterus; (*b*) early performance of the operation; and he thinks that the reason why American physicians have not obtained the same good results as he, is that they delayed the operation too long, or were not called upon to perform it until after other operations had been unsuccessfully tried.

In regard to the technique of the operation, he laid stress on the following points: The preparation for the operation, and the antiseptic precautions should be made as in case of laparotomy. In private practice, some of the measures could be simplified, but essentially they ought to be the same. The opening in the abdomen is made in the linea alba, but should correspond to the incision of the uterus. Therefore, the incision is made without regard to the navel, over the middle of the fundus toward the middle of the symphysis, extending about six and a quarter inches. It is not advisable to evert the unopened uterus, on account of the large incision required for this purpose, except in cases where the fœtus is dead, or there is not sufficient assistance. He also opposes the application of the elastic ligature before the uterus is opened, because the ligature endangers the life of the child, or may incarcerate parts of the child, so that the ligature must be loosened at a time when the hands of the operator are required for more important things. Beside this, the danger from hemorrhage is not so great as is commonly supposed, and can be easily diminished. He never everted the uterus *in toto*, nor applied the ligature before the incision of the uterus. He opens the uterus in situ by a frontal median incision; if he hits the placenta, he cuts through it or separates it on one side. The child is extracted by the legs, and if the head becomes incarcerated the incision is enlarged upward, to prevent a laceration of the wound downward. At the same time an assistant presses the abdominal walls to the uterus, to prevent prolapse of the intestines, and the flow of fluid into the abdominal cavity. By pressing on the inferior segment, and by a slight torsion or flexion of the uterus and of the broad ligaments, the hemorrhage can be lessened. There is some danger in the removal of the elastic ligature, and he advises to do without it if possible.

In regard to the application of sutures, he drew attention to three points, which are considered as the most important: 1. Accurate union of the incised surface of the uterus by numerous sutures, whereby a broad and close union is obtained. 2. Avoidance of suture canals in the cavum uteri. 3. Especial union of uterine surfaces instead of the serosa uteri. As suture material, he prefers silk to silver wire, because silk can be absorbed. Lately, excellent results have been obtained with catgut prepared in oil of juniper, or chromic acid, or sublimate.

Sänger gives the following indication for the Porro operation when the flow of secretion of the uterus is impeded by stenosis of the cervix or vagina, or by tumors, and in cases of infection of the corpus uteri. But he prefers Cæsarean section when the myomata are retrocervical or retrovaginal, because the removal of the whole mass, under the circumstances, is impossible, or very dangerous, and to remove the uterus alone has no result of value.

In cases of osteomalacia he prefers the Cæsarean section, with removal of the ovaries, to the Porro operation. He takes exception to A. Martin's recommendation to perform the Porro operation in cases in which the puerperium becomes dangerous to the woman, as in cases of far advanced affections of the heart or lungs. He thinks that a woman in such a case has as good a chance of recovery after Cæsarean section as after the Porro operation.

GYNECOLOGY.

Both morning and afternoon sessions were devoted entirely to the reading of papers, discussion being postponed until a subsequent occasion.

The morning session was opened by a paper which was sent by DR. H. R. BIGELOW, of Washington, the subject being

CONSERVATIVE GYNECOLOGY.

His idea was that surgery is conservative when it tends to alleviate suffering without depriving the human frame of any of its component elements. Conservative gynecology was defined as any plan which tends to preserve the just equilibrium of human energy in this specialty, before resorting to means for the elimination of the offending organ. It is thus opposed, in a certain sense, to surgical gynecology in which the too free use of operatives measures constitutes a dangerous tendency. It was not believed to be sufficient that a gynecologist be well informed as to the anatomy and physiology of his particular department; it was obvious enough that he should be well equipped in general medicine. This

notwithstanding the fact that few medicines are of use in diseases which are peculiar in gynecology.

Alluding to the subject of fibroid tumors of the uterus, he called attention to the good results which had been obtained by systematic treatment with ergot, and formulated his belief as to the proper treatment of such growths as follows:

1. Many remarkable cures of submucous uterine fibroid tumors from the use of ergot are collected, which is ample reason that this subject should receive careful attention. 2. Electricity is also a remedial agent of great value for these neoplasms. 3. The use of tonics, aperients, and suitable hygienic measures should be properly systematized. 4. Cutter's diet treatment should receive careful investigation. 5. Early operations for these growths are only exceptionally required. 6. Dangerous hemorrhage from them is not the rule. 7. The percentage of these tumors in which life is endangered by hemorrhage is small. 8. An operation should only be the last resort. 9. Hysterectomy, myomotomy, and oöphorectomy will always be dangerous operations, and their dangers should be clearly pointed out to patients.

Conservative gynecology is entirely applicable to tubal diseases and inflammations of the ovary. Oöphorectomy for epilepsy, *per se*, can hardly be conceived to be of advantage by any logical process. Operations for the relief of dysmenorrhœa are seldom indicated.

DR. WEEKS, of Portland, Maine, presented a paper entitled

PREGNANCY COMPLICATED BY UTERINE FIBROID TUMORS.

The paper was based upon a case in which this grave complication existed, and in which the author's preference was to wait until term and then perform Cæsarean section. His opinion was overruled, however, and he was obliged, in deference to the opinion of several distinguished colleagues, to induce premature labor at the fifth month. He succeeded in delivering the fœtus after decapitation, but the mother did not rally from the shock of the operation.

Of thirteen distinguished gynecologists whose opinions upon this subject were obtained by correspondence, nine were in favor of premature labor. To this opinion the author dissented, believing that the best results must usually be obtained by allowing the gestation to continue to term, and then performing Cæsarean section, removing the ovaries and tubes at the same time if possible.

DR. GRAILY HEWITT thought that failure in the author's case might have been due to too rapid evacuation of the uterus. In such cases labor should proceed very slowly.

DR. TRENHOLME, of Montreal, narrated three cases in his experience in which gestation was complicated by the presence of uterine myomata, all of which resulted favorably for the patients. He believed that women with such tumors should not despair of becoming impregnated, and that in very many cases they might with safety go to term.

DR. LAWRENCE, of Bristol, England, observed that the question had arisen as to the propriety of marriage for women who were known to have fibroid tumors of the uterus. His opinion was, that marriage was proper if the woman were not suffering from the symptomatic effects of the tumor. He had seen eight cases in which pregnancy was complicated by such tumors, and in several of them the effect of the pregnancy was to dispose of the tumors. He thought that premature labor should not be induced if there were any reasonable prospect that there would be a normal termination.

DR. GORDON closed the discussion (in the absence of Dr. Weeks), expressing his opinion that premature labor in the author's case was not the proper procedure. He agreed with Dr. Hewitt, that if labor were induced in such cases, it should proceed very slowly. The position of the fibroid should be influential in deciding as to the method of procedure. If the tumor were in the cervix, and likely to fill the pelvis and occlude the parturient passage, prematurely induced labor would usually be indicated.

DR. DANIEL T. NELSON, of Chicago, presented a paper on

THE TREATMENT OF UTERINE MYOMA WITH ERGOT.

It was shown that the influence of this drug upon hypertrophied muscular fibre was much more intense than upon normal. Hence, also its influence must be much more positive upon a diseased (*i. e.*, hypertrophied) uterus than upon a normal one. Its influence must also depend upon the position and surroundings of the tumor, with respect to the mechanical advantage to be gained. Its use by suppository or subcutaneously was often possible when it would not be tolerated for a long time by the mouth. Collective investigation upon this subject should receive earnest attention. The conclusions were:

1. The cases upon record show conclusively the value of this method of treatment.

2. Hyperæmia of the uterus whether induced by miscarriages, displacements, or other abnormal conditions predisposes to the development of these neoplasms.

3. A probable additional cause is some nervous disorder of a trophic character.

4. Ergot is not indicated if the tumor is subperitoneal and adherent to surrounding viscera.

5. Gangrene, from the prolonged use of ergot, is not likely to occur.

DR. BOZEMAN criticised the author's statement that fibroid tumor of the uterus is infrequent in black women. His experience, and that of many other gynecologists, was that black women are much more susceptible to such conditions than white women. On the other hand, ovarian tumors in black women are rarely seen.

DR. NELSON, in closing, said that no one had offered any suggestion which had convinced him of the superiority of any medicinal agent to ergot in the treatment of fibroid tumors of the uterus.

DR. APOSTOLI, of France, read his paper entitled

FARADISM IN GYNECOLOGY.

The value of the induced current as a therapeutic agent was enunciated, and reference made to the author's extensive experience for the past few years in this direction. The coils and electrodes devised and used by the author were exhibited, and the method of using them described.

The author's system of treatment was also explained

at length in English by Dr. Smith, of Montreal, recently a student with Apostoli, subsequent to the reading of the paper.

DR. SMITH, of Montreal, read a paper upon

A NEW THEORY OF TREATING UTERINE DISEASE AND DISPLACEMENTS BY ELECTRICITY.

This theory consisted essentially in the use of electricity after Apostoli's method. The principal cause of uterine disease was said to be want of muscular tone; restore this tone, relieving thereby the organ of its superfluous blood, especially venous blood; improve also its nervous apparatus, and the disease would disappear.

The great value of the electric current in relieving pain in the pelvic organs was also a matter of personal observation by the author.

DR. F. H. MARTIN, of Chicago, read a paper on

THE ELECTROLYTIC TREATMENT OF UTERINE MYOMA,

based upon Apostoli's method of treatment. One of the chief elements of value consisted in exactness of dosage, which is now rendered possible by the use of the milliampèremeter. The factors in this plan of treatment are

1. The local effect of the pole; acid effects being obtained at the positive, and alkaline at the negative pole. Density, rather than volume, is the efficient means; hence arises the method of treating hemorrhage in connection with these tumors.

2. The atrophic effect of the current; it is not the electrolytic action alone which produces the desired end.

3. The electrolytic action of the current. The combined elements being separated, absorption is favored.

4. The antineural effect of the current.

The electrodes used by the author were exhibited and described. For the external pole, an ingeniously constructed hollow disk covered with membrane is used, which, being filled with water and placed upon the abdomen, diminishes to a great degree the resistance of the skin.

No galvanopuncture is used, as done in Apostoli's method, an electrolytic effect, and not a caustic being alone required. A current of more than 100 milliampères is never used. The advantages of this method are: 1. It is free from danger. 2. It is painless. 3. It checks hemorrhage. 4. It rapidly reduces the size of the tumors. 5. It stops neuralgia. 6. It admits of exactness of dosage.

The papers of Drs. Cutter and Semeleder upon the same subject as the foregoing were referred to by the Chair. They will appear in the published Proceedings of the Congress.

DR. ALFRED C. GARRATT, of Boston, read a paper upon

THE TREATMENT OF TUMORS OF THE BREAST BY ELECTROLYSIS.

A prime necessity was that the tumor should be seen in its early stage—whatever its character. Under such a condition women should be encouraged to believe that they could be radically cured. Broad and soft electrodes were used by the author, the entire surface over the tumor being submitted to the action of the current. Each séance should last twenty to thirty minutes, and the current should not exceed 5 to 50 milliampères, according to the resistance. The applications might be made every day or every other day. In some cases only three to four applications were necessary, in others twenty to thirty. The interrupted current might be used for a few minutes after having used the primary. The author had treated 180 cases of mammary tumor by this method, and in 157 there had been a cure, with no recurrence, so far as he knew, in a single case.

DR. ALEXANDER DUNLAP, of Springfield, Ohio, read a most interesting paper on

EARLY EXPERIENCE IN OVARIOTOMY.

His first operation was done in 1843 amid great difficulties and opposition, at the earnest request of the patient, who was conscious and intensely interested during the entire procedure. She lived for twenty days and then succumbed to kidney disease.

The paper was largely reminiscent, and showed the great obstacles which were experienced by the author and his fellow pioneers.

DR. GILMAN KIMBALL, of Lowell, also gave interesting personal reminiscences, chiefly showing the hostility of the profession to ovariotomy and ovariotomists a generation ago.

DR. CORDES, of Geneva, Switzerland, presented a paper entitled

MEDICAL TREATMENT OF UTERINE CANCER.

This method of treatment was considered applicable only to those cases in which radical operation was inexpedient or impossible. It is a well-known fact that many cases in which palliative treatment alone is used survive a long time, perhaps as long as if operative measures had been adopted. Among the substances which may be used topically are solutions of sulphate of copper, sulphate of iron, bromine, acetic acid, iodized glycerine, pepsin, and papaine. The author gave the preference, however, to terebene which he is in the habit of applying on cotton-wool every two or three days. His results with such applications have been very satisfactory.

DR. ERNEST CUSHING, of Boston, concluded the afternoon's work with a paper entitled

MALIGNANT DEGENERATION OF GLANDULAR HYPERPLASIA OF THE UTERUS.

He dissented from the commonly received views of Ruge and Veit, and Thiersch and Waldeyer, respecting the invariable epithelial origin of cancer. The unexplained part of their theory was the frequent appearance of accumulations of small, round cells with epithelial cells in the so-called transition stage, which the author had found did not terminate in many cases in cancer. Another theory must, therefore, be substituted for that of epithelial irritation, as a primary or potent cause, and the author was inclined to believe that it came from without, and, reasoning from analogy, was of an infectious nature. The more frequent use of the cautery was suggested in the treatment of cancerous growths, on account of its antiseptic influence.

The paper was followed by the projection upon an illuminated screen of a large number of photographs from microscopical sections made by the author in the

investigation of this subject, in which the difficulty of absolutely determining the existence of cancer in its earliest stage was amply shown.

WEDNESDAY, SEPTEMBER 7TH.

GENERAL SESSION.

The Congress came to order at the call of the President, at 10 A.M.

The Chairman of the Committee of Arrangements, DR. A. Y. P. GARNETT, announced that some misapprehension had occurred with regard to the reception at Grass Lands, the country residence of Secretary Whitney, that evening. This invitation had been restricted to those only whose presence was desired, as indicated by the receipt of special cards of invitation which had been issued. He further stated that tickets to the reception to-morrow night, at the Pension Office, had gotten into the hands of persons who do not belong to the Congress, and "in order to prevent the humiliating spectacle of Monday," presented at the conversazione, all invitation tickets would be cancelled, and delegates, who were requested to wear their badges, would be presented with new and proper tickets upon calling at the office of Albaugh's Theatre. He also said that, "in order to prevent foreign members being engulfed in the mob, as they were last night, at the President's reception," a special entrance has been arranged for them to-morrow evening.

DR. N. S. DAVIS stated that as a special committee had been appointed at Copenhagen to consider and report at this meeting on the Collective Investigation of Disease, this committee (if any of them are present) would meet at the Riggs House in the afternoon.

THE PRESIDENT repeated his announcement of yesterday, that the programme had been changed, so as to provide for the reading of but one address at each general session, in order not to interfere with the morning meetings of the Sections. He further announced that Dr. Neudörfer, of Vienna, and Dr. Lutaud, of Paris, who were to read general addresses, would be absent from the Congress, but no reason was assigned for their failure to appear.

The President then vacated the Chair in favor of Dr. Durante, of Italy, and PROF. SEMMOLA delivered in French his address on

BACTERIOLOGY AND ITS THERAPEUTICAL RELATIONS.

(See page 298.)

At the conclusion of the address, DR. LOUIS A. SAYRE, of New York, said he was sure that all the members of the Congress had, like himself, been electrified and delighted as they listened to the eloquent address of Semmola. His masterly exposition of the important subject of bacteriology and its relations to therapeutics, and its wonderful influence upon the future of medicine, placed them under a weighty debt of obligation. He moved a unanimous vote of thanks.

DR. HINGSTON, of Canada, seconded the motion in a few complimentary remarks, part in French, and part in English.

DR. A. L. GIHON offered a resolution that the President of the Congress be authorized to appoint a committee, to consist of an equal number from each nationality represented in the Congress, for the purpose of selecting the place of meeting of the Tenth International Medical Congress to be held in the year 1890, which committee shall report on Friday morning, immediately before the address of Dr. Blandford. Adopted,

The session then adjourned.

SECTIONS.

PUBLIC MEDICINE.

THE PRESIDENT read a paper forwarded by DR. BENJAMIN W. RICHARDSON, of London, on

SOME POINTS IN THE GROWTH OF PREVENTIVE MEDICINE IN GREAT BRITAIN.

Dr. Richardson called attention to the fact that the English people being cut off from other countries by the sea, had to invent all measures of prevention for themselves; and yet this very isolation did good in the end, owing to the fact that it made England mistress of the seas, and by so doing necessarily produced conditions favorable to the study of public health, owing to the large number of men under control. England stands equal to any nation in the practice of preventive medicine. The necessity of preventive measures was illustrated by percentages showing the relative death-rate in the army, from disease and war in former years, as compared to that of the present day. In older times the death-rate from disease far exceeded the death-rate from injuries, but this condition of affairs has been almost reversed at the present day. Every war England has had has taught her a lesson in preventive medicine, and while the medicine has often been a bitter one, it has in the end proved of value. In the Crimean conflict measures for sanitation were carried out which had previously existed here in theory, while many other conditions arose which required urgently the entire attention of all persons interested in public medicine.

He also spoke of the changes produced in public institutions, such as prisons and workhouses, by the sanitary measures lately introduced, and of the decreased death-rate among the laboring classes by the same.

DR. JOSEPH JONES spoke of the valuable information which the Civil War had given us in regard to these matters, and regretted that while the Federal army had been able to use its information by reason of the support of the Government, that the Confederate lessons had unfortunately almost perished, owing to want of proper care and support.

DR. Y. R. LEMONNIER, of New Orleans, read, in part, a translation of a paper forwarded by DR. DOMINGOS FREIRE, of Rio de Janeiro, Brazil.

THE INOCULATION OF YELLOW FEVER.

The author first narrated, as briefly as possible, the history of his discovery and announcement of the microörganism of yellow fever. Ever since 1880, he had labored to establish the identity as well as to produce an attenuated form of the virus of the disease which could be employed for the purpose of preventive vaccination. In addition to his first report he has published nine memoirs on the subject.

The microbe, he said, is an infinitesimally small vegetable organism, found in the blood as well as in the

secretions of the yellow fever patients. Its natural history is as yet very obscure. Science is as yet but lisping the first syllables concerning it. Observers have thus far pursued purely technical methods of study, without giving sufficient attention to the physical character, the mode of life, and the chemistry of the organism. This carelessness on their part has been to blame for many failures in the study of not only this but of all micro-organisms.

In the concluding portion, the author gave the statistics of his vaccinations in Brazil. He showed that the vaccinations, sanctioned by the government, had been made during a severe epidemic of the disease, in the worst quarter of the city, among persons, for the most part foreigners, and therefore more susceptible to the disease, living in a condition of wretchedness hardly conceivable in a foreign country. The result had been that, with almost no exceptions (the exact figures were given) those who were vaccinated escaped the disease, although they remained exposed to the contagion, whereas those who were unvaccinated died in vast numbers. In conclusion he asked attention to a number of monographs by himself and others on the subject in question.

[Dr. Freire's paper will appear in full in an early issue of THE MEDICAL NEWS.]

DR. J. MCF. GASTON was thoroughly convinced that the claims of Dr. Freire were honest, as he was stationed in Brazil during the first years in which the experiments were carried on, and was aware of their nature and the manner in which they were being received before he left that country. Further, he thought, it would not be possible for Dr. Freire to come so far away from home or even to publish so repeatedly his claims and the accounts of his investigations if they were not as he represented them, without giving occasion to his opponents at home to produce at least some evidences of the deception. In conclusion he proposed a series of resolutions which after amendment were adopted as follows:

Whereas, inoculation against yellow fever, if it prove successful after further examination, is clearly beneficial to the human race throughout the world, and

Whereas, the facts presented by the experiments of Dr. Freire afford reasonable assurance of its protective influence in Rio de Janeiro,

Resolved, that this Section recommends coöperative investigation of the results obtained by yellow fever inoculation as protection against that disease, and that adequate preparations by the governments represented in this Congress be recommended, and that the matter be brought to the attention of the general sessions of the Congress.

DR. JOSEPH JONES, of New Orleans, President of the Section, stated that he had confirmed all of the statements of Dr. Freire with reference to the microbic origin of yellow fever, and that he had many years ago seen and described the microörganism referred to.

DR. EDWARD LEIGHTON, of London, then read a paper on

THE METROPOLITAN SYSTEM OF DEFENSE AGAINST INFECTIOUS DISEASES.

The paper consisted in a review of the workings of the system in question throughout the large cities of England and Scotland, resembling very closely that with which we are familiar in the cities of the United States The essayist concluded with a strong endorsement of the system and its workings, although he pointed out some important features in which it was yet in a measure defective.

GYNECOLOGY.

DR. CUTTER, of New York, read a paper on

GALVANISM OF UTERINE FIBROIDS.

The first operation was performed, in conjunction with Dr. Kimball, of Lowell, upon a patient of the latter, August 21, 1871. Platinum needles were used, and the tumor was punctured from opposite sides of the body, the needles then being approximated. The author had no knowledge that any similar operation had ever been performed previous to that one. The platinum needles were found unsatisfactory, not being stiff enough to penetrate readily the firm tissues of fibroid tumors. The author then devised electrodes of steel, one variety being triangular in cross section, and another corkscrew-shaped and gold plated. The battery was a single cell with a large number of elements, and a current of sufficient intensity for any practical purpose was obtained with it. In the development of his method the author experienced great opposition and hostile criticism. Referring to the alleged value of the milliampèremeter, the author thought it was not absolutely essential, as his own experience had demonstrated that good results could be obtained without it. Apostoli's criticisms of the author's work and methods were probably made without due appreciation of the facts.

DR. SMITH, of Montreal, replying for Dr. Apostoli, observed that the latter did not have the author of the paper in his criticism upon the methods for treating uterine fibroid tumors with electricity, which preceded his own. Apostoli preferred to puncture the tumor through the vagina rather than through the abdominal wall on account of the greater safety of the former in case of subsequent inflammation. This method of puncture was also favored on the ground of greater accessibility in most cases. Apostoli's proposition was, that all varieties of uterine and ovarian disease, with the exception of ovarian cysts and malignant diseases, were amenable to treatment by one or the other form of electricity. With regard to the curability of fibroid tumors without galvano-puncture, Dr. Martin had stated in his paper (see Tuesday's proceedings) that they could be cured. If a puncture were made, Apostoli recommended the use of a trocar, which should be plunged into the tumor (per vaginam) to a depth of one-third or one-fourth of an inch. Antiseptic precautions before and after the operation should be the invariable rule.

DR. F. H. MARTIN thought it should be remembered that the milliampèremeter merely indicated the strength of the current which was passing, not its density or the resistance which it was overcoming: it was, therefore, not so essential a factor in the appliances for treatment as Apostoli maintained. He criticised Apostoli's method of treating hemorrhage on account of the enormous strength of current which it required. He was able to accomplish the same end with the use of far less force by applying sounds successively to different sections of the uterine mucous membrane, each sound being insulated except for a very limited extent, which varied

as to situation sound, the electrical current passing only through the non-insulated portion. He believed that Cutter's battery was inefficient for the purpose for which it was constructed, and that it could by no means give rise to a current which would traverse a space of two inches, through solid tissues, as asserted.

DR. KIMBALL, of Lowell, being asked by the Chair for a brief account of his early experience with electricity in the treatment of fibroid tumors of the uterus, said that he believed the idea of such a method of treatment was original with him. He had become tired of telling women with such tumors that nothing could be done for them, and the use of galvanism occurred to him as an expedient that might be serviceable. Dr. Cutter assisted him in carrying out his ideas and in operating upon certain patients.

DR. GARRATT, of Boston, referred to experiments which he had performed upon rabbits to test the strength, resistance, and effect of galvanic currents. He found that no great pain was caused in the animals by the introduction of his electrodes, but when the latter were approximated within the tissues, there were evidences of intense pain. He found that it was quite possible, as Dr. Cutter had stated, to pass a current through and across two inches of solid tissue. This seemed to be contrary to the fixed laws of electricity, and he could only account for it by believing that the resistance within the tissues of the body was far less than at the surface.

DR. APOSTOLI closed the discussion of his paper (see Tuesday's proceedings) by reiterating his belief in the necessity of exactness of dosage in the administration of electricity and the value of the milliampèremeter for that purpose. Such a plan of dosage was insisted upon if the medicament, calomel, opium, etc., were used to accomplish certain ends, and the same rule should hold good in the use of electricity.

DR. CUTTER desired to ask if Dr. Apostoli had ever actually cured a woman with fibroid tumor of the uterus by his method.

DR. APOSTOLI replied that he had seen relief from the symptoms which such patients complained of under his treatment; that is, the women were no longer sick.

DR. M. D. SPANTON, of Hanley, England, forwarded a paper on

CYSTITIS IN WOMEN,

which was read by the Secretary.

The author wished to draw the line sharply between irritability of the bladder and inflammation or cystitis. The former is a very common condition, and can be excited by the greatest variety of causes, whether constitutional or local. If the irritability thus excited by whatever cause, be prolonged sufficiently, cystitis will result. The author considered the empirical treatment of bladder troubles quite unjustifiable. The organ should first be carefully explored, its true condition, and, possibly, its cause ascertained, after which it should be treated symptomatically, each case upon its own merits.

DR. GRAILY HEWITT read a paper upon the

RELATIONS BETWEEN CHANGES IN TISSUES AND CHANGES IN THE SHAPE OF THE UTERUS.

Whatever the statements of various investigators may be as to the condition of the uterus post-mortem, the author did not believe such statements could be taken as a basis for propositions concerning the position and condition of the tissues of that organ during life and health. The term chronic metritis is in common use, to signify a softened, possibly enlarged condition of the organ, with or without a more or less offensive discharge from its canal. This need not be an inflammatory condition, or the result of inflammation. It more frequently coexists with a weak and flabby condition of the tissues of the body in general; that is, a condition of general starvation. With this condition the organ is very susceptible to changes of position when slight causes, such as traumatism, etc., are superadded. Then congestion and actual inflammation may follow; a puerile condition of the uterus also predisposes to faults of position. Hence it may be said that undue softness of the uterus, with imperfect nutrition, precede flexions. These are followed by congestions and hypertrophy. Compression of the uterine tissues from flexion, is followed by chronic metritis and endometritis.

DR. W. C. WADE, of Holly, Michigan, then read a paper upon

DISPLACEMENTS OF THE UTERUS.

His conclusions were the result of an experience of 3000 cases, and he believed that displacements were more frequent than any other form of female disease. His conclusions were thirty-nine in number, and demonstrated principally that such conditions were most amenable to treatment by mechanical appliances, and that every gynecologist to be successful should be possessed of sufficient ingenuity to prepare an instrument suited for each particular case.

DR. WILLIAM L. REID, of Glasgow, Scotland, read a paper entitled

THE REMOTE RESULTS OF THE OPERATION OF SHORTENING THE ROUND LIGAMENTS FOR DISPLACEMENTS OF THE UTERUS.

He defined remote results as those which occurred at least one year after the performance of the operation. Among British gynecologists, from whom the author had made personal inquiries upon this subject, Matthews Duncan, Skene, Keith, Playfair, and Wallace could not speak well of it as the result of personal experience and observation; Halliday Croom approved of it; Alexander himself thought it would accomplish certain results if properly done; and Adams had found permanent improvement several years after the performance of the operation in certain cases. If the operation were not done carefully and thoroughly, it should not be blamed if good results did not follow. In the author's experience (eight cases) there was permanent benefit in some and not in others. It did not seem to follow that general improvement would necessarily result even though the original displacements of the uterus remained permanently relieved. If the perineum has been destroyed and a pessary cannot be used to remedy a displaced uterus, this operation is indicated. Immediate relief may not be obtained, and it may be necessary for a patient to be under observation for six months after the operation has been performed. If a pessary can be worn after the operation, the results may be better than would otherwise be the case.

(To be continued.)

NEWS ITEMS.

WASHINGTON.

(From our Special Correspondent.)

THE MEETING OF THE CONGRESS.

THE auditorium of even the handsomest theatre never presents a very cheerful or inspiriting appearance in the daytime. The lights are dim, the scenery, divested of the artificial glamor of the footlights, looks unreal, and there is a general flavor of "funeral baked meats" pervading the whole atmosphere. Albaugh's Opera House, in which the International Medical Congress assembled for its ninth triennial session, proved no exception to this rule, though the theatre is new and well constructed. The slanting rays of light which fell from the windows half opened on the eastern side of the building, and glanced upon the Egyptian sarcophagus-like decorations of chocolate and old gold, and half illuminated the strange mixture of gray heads and young faces which crowded the auditorium, leaving in comparative obscurity the brilliant array of ladies and their escorts who crowded the galleries, gave to the scene a weird and strange effect. The whole of the lower part of the theatre was given up to the delegates, and they more than filled its utmost capacity. In the boxes and the galleries were the spectators, some of whom were the ladies who had accompanied the delegates, but many were visitors attracted out of curiosity and by the announcement that the President of the United States would be present and open the proceedings.

Long before the time named for the opening every seat was filled, and those familiar with previous sessions of the Congress, glancing around on the members assembled, saw a number of physicians who occupy high positions in the profession, but they were, at the same time, struck by the notable absence of a very large proportion of those who are best known in American medicine. Among the New England representatives, the Bowditches, Bigelow, Warren, Cheever, Storer, White, Blake, and the well-known features of the Autocrat of the Breakfast Table, Dr. Oliver Wendell Holmes, were missed. New York had evidently failed to send Gaillard Thomas, Jacobi, Barker, Draper, Sands, Dalton, Weir, Loomis, Markoe, Emmet, Agnew, Janeway, Delafield, and Noyes. Among the Philadelphia delegates one looked in vain for Stillé, Hayes Agnew, Leidy, Da Costa, Gross, Weir Mitchell, Bartholow, Wood, Pepper, Parvin, Osler, Duhring, or Goodell; and from the South and West many prominent men were also missed, including Donaldson, Johnston, Tiffany, Welch, Atkinson, Hunter McGuire, Battey, Campbell, Whittaker, Reamy, Yandell, Kinloch, Conner, Reeve, Fenger, Geddings, Hardaway, Engelmann, Hyde, Lyman, Hosmer Johnson, and Byford. Amongst the foreign delegates the conspicuous absentees were equally marked, and on all hands were heard involuntary inquiries—where are Sir James Paget, Virchow, Jenner, Pasteur, Bryant, Verneuil, Gull, Volkmann, Lister, Jaccoud, Spencer Wells, Esmarch, Playfair, Ziemssen, Holmes, Charcot, Liebermeister, Mackenzie, Koch, and Erichsen? All these, and more, whose presence had graced, and whose labors had given dignity and importance to previous Congresses, were painfully missed.

Precisely at eleven o'clock the curtain rose upon a sylvan scene and disclosed the President of the United States seated in the woods at a small table, with the Secretary of State on his left and Speaker Carlisle on his right, who modestly endeavored to conceal his identity behind a very tall white hat. Grouped around them were some fourteen or fifteen members of the Executive Committee and distinguished foreigners, each one decorated with a little silver medal on a background of crimson ribbon. As the curtain rose, the audience greeted the Chief Magistrate with the heartiest applause.

The Chairman of the Executive Committee, DR. H. H. SMITH, of Philadelphia, stepped forward from the right wing and introduced the President of the United States, who was received with all the enthusiasm befitting the occasion. He rose promptly and opened the Congress in a few sonorous and well-delivered sentences, and on ending gave a sharp tap of the gavel on the table before him.

When the nominations for Vice-Presidents were subsequently read, embracing names eminent in medical science the world over, the suggestion involuntarily occurred to all that not a dozen were present of the entire list of nearly eighty distinguished foreigners upon whom it was proposed to confer this honor. This was so obvious that a delegate in the back part of the theatre, speaking with a strong Irish accent, said: "Mr. President, I would like to ask if it is proper to elect men as Vice-Presidents who are not present? I would move to amend"—— Here President Davis interposed and said: "It is hardly in order to interrupt the proceedings now, because it is impossible to know who will be here. The gentlemen who have been named have all been communicated with and have accepted the positions, and I declare them elected."

This cutting of the Gordian knot was received with due applause, but when President Davis sought to follow up his victory by inviting the Vice-Presidents to step upon the platform the force of the objection was apparent, as, after a painful pause, only one Vice-President, Dr. Phillips, of London, disclosed his presence. He made his way to the stage, and Dr. Davis hurriedly remarked that it was not necessary to delay the proceedings by waiting for the other gentlemen.

Secretary General Hamilton's report was brief and pointed, and noticeable chiefly for the cleverness with which it skated over the points of difference in New Orleans and Chicago, which had played so prominent a part in the fortunes of the Congress.

The address of welcome from the Secretary of State, Mr. Bayard, was scholarly and graceful.

The replies of the foreign delegates were the most interesting feature of the meeting. The first call made by President Davis upon the English Deputy Surgeon-General received no response. Dr. William H. Lloyd, of the Royal Navy, was then appealed to, and with some nervousness he gave response in unmistakable English accents. Dr. Léon Le Fort, portly, dignified, and gray-haired, responded briefly, on behalf of France, in his native tongue. Professor Unna, a dermatologist, selected to respond for Germany, replied in German. But the distinguished representative of Italy, Professor Semmola, whose appearance, graceful gestures, and artistic vocal inflexions, reminded many present of Léon Gambetta, answered in French, and with force

and fluency. The Russian representative, Professor Reyher, spoke briefly and quaintly in broken English.

The opening session ended with an inaugural address from Dr. Davis. During its delivery the galleries had emptied, and many had departed from the body of the meeting. At its close, President Cleveland, Secretary Bayard, and Speaker Carlisle successively shook President Davis by the hand, and the first day's proceedings were declared at an end.

An unpleasant episode occurred in connection with the responses of the foreign delegates which has created much talk. It appears that Prof. Durante, of Rome, was requested by the Secretary-General of the Congress to respond on behalf of the Italian members, and he accordingly prepared an address, and called upon Dr. Hamilton to inquire about the hour he would be expected to deliver it. Dr. Hamilton then informed him that Dr. Semmola, of Naples, would respond to Secretary Bayard, as he claimed the right, as a representative of the Government of Italy, and the Committee felt constrained to concede it to him. Within an hour Prof. Durante sent the following note to Dr. Hamilton:

Secretary-General of Medical Congress:

Having been invited by the Secretary-General of the Medical Congress, Surgeon-General Hamilton, to answer, in the name of my country, the address of the Secretary of State, I accepted with pleasure and so informed, by letter, the Secretary-General. My surprise was, therefore, great and painful when this morning, while inquiring about the order of exercises at the opening of the Congress, the same Surgeon-General Hamilton informed me that he had requested Dr. Semmola, of Naples, to make the answer.

This change was done without my knowledge and consent, and was, therefore, an insult. I am the representative of the Italian Government, inasmuch as I was delegated to this Congress by the Minister of Public Instruction, the only Minister that has authority to make such an appointment. Prof. Semmola's appointment is not from the Government, but from one Minister—that of the Interior—as an expression of personal regard. The plea that he is a Senator of the kingdom should not be considered in this matter, as this is a medical and not a political Congress. In view of the foregoing and of the personal affront, I hereby withdraw from the Medical Congress aforesaid.

FRANCESCA DURANTE.

This episode, however, was finally settled through the earnest efforts of Dr. Hamilton and others. In response to a letter from Dr. Hamilton a note was received from Dr. Durante on Wednesday in which he said: "I thank you for your explanatory and very kind letter and, although I feel that my position as the representative of the Italian government would, under the circumstances, suggest my withdrawal from the Medical Congress, the kind disposition of yourself and of the officers of your committee toward me and my country overcome my sense of offended dignity and lead me to respond to your kindness by remaining and participating in the proceedings of the Congress."

To make the reconciliation more complete it was determined that Dr. Durante should preside at the General Meeting of the Congress on Wednesday, at which Dr. Semmola was to deliver his General Address. On the conclusion of the Address Dr. Durante and Dr. Semmola shook hands very cordially.

WHAT PROMINENT MEN SAY OF THE CONGRESS.—DR. N. S. DAVIS said to a represensative of THE MEDICAL NEWS, on Thursday evening, in reply to the inquiry whether he thought the Congress had been a success, that in point of numbers it stood second, if not first.

"But as to its character and the scientific value of its work?"

"Well, I have seen all the presidents of Sections today, and they each and every one of them report most favorably."

"From your experience of previous Congresses, do you not think there was a conspicuous absence of distinguished foreigners—such men, for instance, as Paget and Gull, and Pasteur and Verneuil, and Virchow and Lister, and others whose names are known all over the world?"

"Yes, that is so; but then you must remember that many of those you name are over seventy years of age, and at their time of life, and with their professional duties, a journey across the Atlantic, and such a prolonged absence as is thereby implied, is a very serious matter. Sir James Paget himself told me he feared he would be unable to attend on account of his advancing years. Professor Virchow wrote me that he could not come because of an important conference to be held in Berlin this month, of which he is Chairman of the Committee of Arrangements. I do not remember exactly what that conference was, but it was something combining hygiene with some other subject."

"But what about Neudörfer and Lutaud, of Paris, who were to have been here and to have taken part in the proceedings?"

"Neudörfer is detained by sickness; and Lutaud—well, I can't say anything about him."

"Then, on the whole, do you think the delegates compare favorably with those of other Congresses?"

"Yes, I think so. They are younger men, true, but I understand some very valuable papers have been contributed even by those who did not come. M. Simon, for instance, a very eminent man I am told, has forwarded a most important paper. And you must remember we have had difficulties with regard to the foreign delegates."

"What were those?"

"I do not care to go into them, but, gentlemen—you could count them on the fingers of your two hands—have written and begged foreign delegates not to come. They said there were factional differences. They even went so far as to say that Washington was unhealthy; that the weather was very hot, and that typhoid fever was prevailing. Of course, this kept some away."

"How do you think the American reputation for hospitality has been maintained?"

"That I would rather say nothing about. I have heard many complaints from the foreign delegates that they were not able to get into the White House to see the President and Mrs. Cleveland last night—many such complaints. It was unfortunate, very. I am very sorry it occurred."

"Is there any prospect, do you think, that the Congress will ever meet in the United States again?"

"Not for twenty years at least. These sessions are only triennial, and it is not likely that Washington's turn will come round again for twenty years, if then."

SECRETARY-GENERAL JOHN B. HAMILTON was asked how many delegates have registered.

"Over twenty-six hundred."

"How many foreigners?"

"Three hundred it is estimated, but I have not the local registration-book at hand."

"Have you been cramped for want of money?"

"Yes."

"If the dissension beginning at New Orleans had not taken place, do you think there would have been a larger contingent of foreign delegates?"

"If there had been no system of general misrepresentation practised by many of those who resigned and followed up by personal solicitation to stay away the attendance might have been larger; as it is, the attendance from transatlantic countries is larger than it was at former Congresses."

"Do you know of any dissatisfaction having been expressed by foreign delegates as to their treatment here?"

"No, on the contrary, see Sir James Grant's speech to-day, on this point."

"What do you think of the scientific aspects of the Congress?"

"They are entirely satisfactory, and will take rank with any former Congress. I can only view with contempt the statements made with evident intent to disgrace America and belittle our guests."

"What about the absence of those American physicians who withdrew from the Congress, and remain away?"

"While their absence is to be regretted, yet the facts show the Congress is entirely successful without them."

DR. UNNA, of Hamburg, being asked "What opinion he had formed of the Congress?" replied:

"I do not think it is of as high a character as those of Copenhagen and London. The discord at home has prevented many foreigners from coming. This discord was so prominently heralded abroad that it became in a measure international. If it had not occurred many Germans would have come, not thirty or fifty, but two hundred. This number would have included the most prominent men of the country. I regret that the leading physicians of America did not overlook the discords when it was too late to reconsider action, and so give to the Congress more of the air of being international. Men like Agnew, Loomis, and others are much missed. My strongest impulse in accepting the vice-presidency, and reading a paper, was to prevent the Congress from dwindling into simply a national affair. I regret that others did not take the same view. The scientific aspect, although not equal to former Congresses, is better than was to be expected under the circumstances. Papers in the Dermatological Section were good for the most part, but the discussions were poor; but such is the case at all Congresses. Socially I have not had much personally to complain of, although I am aware of many deficiencies. I know that many errors have been committed. The arrangements have been poorly announced. On the whole, there is much that is to be regretted."

DR. W. T. LUSK, of New York, was asked what opinion he had formed of the Congress.

He replied, "I have heard some complaints from foreign delegates regarding a want of courtesy on the part of the officers of the Congress. It seems there has been some want of business management, and perhaps a lack of experience on the part of the officials in managing such affairs. They have been too much disposed to regard the foreigners as they would our own people, who are always willing to look after themselves, while a European seems to require some one to take care of him."

"What do you think of the scientific value of the Congress?"

"I believe the volumes of Transactions, when published, will be equal in respect of the papers contained therein, to those of any preceding Congress."

"If the unfortunate dissension which began at New Orleans had not occurred, would not the success of the Congress have been more marked?"

"Well, I must say the presence of prominent members of the profession at the discussions was greatly missed."

Dr. Lusk, who was somewhat unwilling to give his views for publication, also stated that he thought that in the division of papers between the Sections of Obstetrics and Gynecology, the former had been unfairly treated by being deprived of several papers properly belonging to it. For instance, a paper on Cæsarean Section, and another on Extrauterine Pregnancy, had both gone to Gynecology, instead of to the proper section—Obstetrics.

DR. MARIANO SEMMOLA, Professor of Therapeutics in the University of Naples, Italy, was asked his opinion of the present Congress, and replied to the queries addressed to him as follows:

"You have attended other Congresses?"

"Yes, indeed I think I have attended every one."

"What opinion have you formed of the scientific value of the Congress?"

"It is considerably below the average of any of its predecessors."

"Do you think that if the unfortunate dissensions at New Orleans had not taken place that a larger number of distinguished men from Europe would have attended this Congress—such men as Porro, from your own country, and Pasteur, Virchow, Esmarch, Paget, MacCormac, etc.?"

"I have met many, if not all those gentlemen at preceding Congresses, and have no doubt at all that if there had been no quarrel among the profession here, some, if not all of them, would have crossed the Atlantic."

"How did you happen to come yourself?"

"I was assured that the quarrel was a matter that had entirely passed over, and so I came on."

"Have you met many of the Americans whom you expected to see?"

"Very few indeed, and it is a matter of sincere regret to me."

"How have the social aspects of the Congress appeared to you?"

Dr. Semmola smiled at the question, shrugged his shoulders and said: "Well, I have had one or two private invitations, but as for the rest—it does not exist."

"You are not favorably impressed then?"

"No; how can I be?"